Telephony.

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H. B. McMEAL, PRESIDENT AND EDITOR — F. S. KENFIELD, VICE-PRESIDENT — H. D. FARGO, SECRETARY AND TREASURER
S. R. EDWARDS, Technical Editor — J. C. KELSEY, Financial Editor
J. R. HASTIE, Advertising Manager — E. KLAPPENBACH, Asst. Advertising Manager — W. E. RAYMOND, Subscription Manager

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DON'T WORRY.

It is not the work, but the worry
That makes the world grow old,
That numbers the years of its children
Ere half their story is told.

That weakens their faith in heaven
And the wisdom of God's great plan,
Ah, 'tis not the work, but the worry,
That breaks the heart of man.

The Two Conventions.

As announced on another page of this issue, the date of the convention of the Independent Telephone Association of America has been changed. According to the amended plan, the convention will be held January 6, 7 and 8 at the Hotel La Salle, Chicago. The original plan of the National Independent Telephone Association to hold its convention at the Hotel La Salle, January 13, 14 and 15 remains unchanged.

Coming only a week apart, these two conventions should be utilized by Independents in trying to bring about a consolidation of the two associations. Both have avowed the same purpose—the development of the Independent telephone industry. Surely a platform with this end in view, broad enough for all to stand on, can be adopted. Why divide forces when more effective work can be done by one united organization? Think it over and be prepared to act when you come to Chicago in January.

State Operation of Telegraph and Telephone Systems.

The use of the telephone has become quite general throughout the civilized world, but its development has been much greater in some parts than in others. In most countries outside of the United States, the control of the telegraph and telephone is vested in the state.

In looking over the history of state control, it is learned that the government first took control of the telegraph primarily for military purposes. The optical telegraph, a type of semaphore signal such as is now used by railways, was utilized by Napoleon and in 1837 France passed a law making every kind of telegraph a state monopoly on the grounds that it was not safe to allow such an important device in other hands than the state. Other European governments followed in making the telegraph a state monopoly and in 1870 the English post office purchased control of the telegraph systems for £10,000,000. In making a monopoly of the telegraph, England's primary reason was stated to be the need for an efficient service for industrial, commercial and social purposes, also for the introduction of a cheaper tariff.

Before the time of the telegraph, the post furnished the only available means of communication, and it was but natural that, when the telephone came under government control, its operation should be placed under charge of the post office, as it furnished another form of communication.

The invention of the telephone provided still another method of communication and it likewise was placed under supervision of the state's post office. In England, the High Court, in 1880, declared that the telephone in law, was a telegraph instrument. Just recently the telephone has become an instrument for the transmission of telegrams, but many years ago several European governments equipped their telegraph offices with the telegraph and telephone instruments.

Some statistics regarding the operation of government telegraph and telephone system is given in the article "Analysis of the Telephone Possibilities of Chile," by Bela Gati, which appears on other pages of this issue. Mr. Gati has made a study of the conditions in Chile and his conclusions as to what the government may accomplish in extending its use of the telephone in that country, are of particular interest at this time.

Poor Man's Arithmetic

By HERBERT KAUFMAN

Greenbacks don't vary a hair's breadth—in size. But there's another dimension your haven't considered—value. Money grows or shrinks according to the pocket in which it's carried. There are ten times more pennies in a widow's dime than there are in yours.

Necessity, not the mint mark, establishes the preciousness of currency. A waster's hundred isn't nearly so much as a laborer's ten. Hunger and want are magnifying glasses through which You never get a chance to look.

You aren't mean—just thoughtless. You never studied arithmetic in the School of Privation, so you can't see the importance of small sums.

You were thinking of your own scale of living when Jimmy asked for a raise yesterday—and the amount didn't seem big enough to bother about; besides, the market that supplies Jimmies is always crowded. You can fill his place over night at his present wage—competition between the children of the poor is ceaseless and bitter and intense.

Poverty isn't able to haggle and bluff and hold out for it's rights. There are no unions to protect the interests of untrained and unorganized rag tags of labor—and it doesn't occur to you that Higher-Cost of-Living isn't a snob who recognizes no class distinctions, and visits porters and errand runners and bookkeepers as well as employers.

Meats and cereals, and rents and clothes keep growing dearer—the same amount of coal and wood calls for a few more pennies every season.

But the charwoman, rubbing and scrubbing from dusk to dawn, and the underclad, overpatched, chattering child out on the delivery wagon, and the colorless, debt-ridden pen pushers back in the office, aren't in a position to make a stand for a living wage, and stand to make good.

There are millions of underdogs ready to accept your scrawniest bones. But don't you try to make your millions out of their helplessness!

Winter is here! The tenements are translating dimes into slices of bread, and pinches of coffee, and handfuls of fuels.

And if your business is in such bad shape that you can't afford to translate some of your wine, and cigar, and theater, and automobile dollars into a few great big, warming, nourishing messages of happiness this Christmas, make up your mind that your affairs are too far gone to be pulled through with scrimpings from the little people.

"Good Luck" is a sentimental old dame, and somehow or other there's always another chance tucked away in her grab bag for those who remember.

Copyright by Herbert Kaufman

Date of One National Telephone Convention Changed

NOTICE SENT OUT BY INDEPENDENT TELEPHONE ASSOCIATION OF AMERICA.

Complication in convention dates necessitated our changing to January 6, 7 and 8, 1914, at Hotel LaSalle.
Plan now to attend! Watch for future announcements. Don't forget the date.
All manufacturers and supply dealers will have space, previously assigned for exhibits.
We will gladly make reservation for you at Hotel LaSalle so long as rooms are available, if you will notify us of your desire.

Rates.

One person.

Room with attached bath, per day.....$2 to $3
Room with private bath, per day.....$3 to $5

Two connecting rooms with bath.

Two persons, per day.....$5 to $8
Four persons, per day.....$8 to $15

Two persons.

Room with detached bath, per day.....$3 to $5
Room with private bath, per day.....$5 to $8

Suites.

$10 to $35 per day.

Better make reservation now.
Topics will be discussed that are of vital importance to every telephone operator, regardless of whether company represented is large or small.
You owe it to your stock and bondholders to come.
This association represents Independent telephony.
Have you sent in your application for membership?
The membership fee has been fixed at the nominal sum of $5 per annum, and each member company will be entitled to one vote. There will be no discrimination in this respect between the large and small companies.
We now have enrolled 184 companies operating approximately 500,000 telephones in 20 states and Canada.

Yours very truly,
INDEPENDENT TELEPHONE ASS'N OF AMERICA.
(Signed) W. S. Vivian, Secretary.

Consider Government Ownership of all Wire Systems

President Wilson and Postmaster General Burleson Confer on Subject of Taking Over Telephone and Telegraph—Seek Inquiry on Matter—The Trust Question—Four Points of Policy Definitely Decided at Conference with House Judiciary Committee

President Wilson began last Wednesday the consideration of two proposals of intimate concern to the American people, says John Callan O'Laughlin, in a special dispatch to the Chicago Tribune.

The first contemplates a national and international investigation to determine the advisability of government ownership and operation of telegraph and telephone lines.

The second has reference to the suppression of trusts and the restoration of competition in business.

In connection with the former proposal, the president held a conference with Postmaster General Burleson, as a result of which the cabinet officer, with the approval of his chief, will incorporate in his forthcoming annual report a recommendation that congress empower the administration to make the inquiry suggested.

At the same time the Interstate Commerce Commission will press the investigation which it inaugurated a year ago at the instance of the attorney general. The railroad valuations commission will begin to estimate the value of the existing lines, which according to a statement made by Postmaster General Burleson, are worth anywhere from $100,000,000 to $300,000,000.

Four Points Against Trusts.

With respect to the trust matter the president discussed it at length Wednesday with the Democratic members of the house judiciary committee. The four points definitely determined upon—others will be settled at future conferences—were:

Maintenance of the Sherman law intact.

Prohibition of interlocking directorates.

Provision for an easier method of fixing personal responsibility upon heads of corporations and their punishment by jail sentences for violation of any anti-trust law.

Effective dissolution of combinations found to be operating illegally.

At the further conferences to be held these propositions will be considered:

Creation of an interstate trades commission.

Prohibition for any corporation to engage in interstate business save under a license to be issued by the federal government.

Either of the big propositions considered, is of far-reaching importance and the administration realizes the need of making haste slowly with respect to their settlement.

Tells of Public's Demand.

In a statement made following his conference with the president, Mr. Burleson spoke of the widespread demand for government ownership of the telegraph system, those favoring it regarding it as the logical next step in the plan to place under government control the various methods of communication. He said the Democratic party always has approached projects of this magnitude with caution.

"The president and I," he continued, "both have an open mind on the proposition and both believe that a thorough and exhaustive study should be made, not only in this country, but abroad, before we undertake to decide on anything definite."

Gets Advice from England's Postmaster General.

Mr. Burleson referred to the fact that an investigation in this connection has been started by the board of physical valuation and that he recently had two long conferences with Herbert Samuels, head of the English postal system, regarding the government owned telegraph lines in England. He wants the system in other European countries also studied.

While Mr. Burleson estimates that the telegraph property

is worth anywhere between $100,000,000 and $300,000,000, attention is called to the fact that the American Telegraph & Telephone Co. alone has a capitalization of $393,000,000 and claims that its assets are worth $924,000,000. An anti-trust suit against several subsidiaries of this company is now pending.

The total capital stock of telegraph and telephone companies is over $1,000,000,000. However, under an existing law, the United States is authorized to purchase the telegraph lines at an appraised value "to be ascertained by five competent, disinterested persons, two of whom shall be selected by the postmaster general, two by the company interested, and one by the four previously selected."

BRANDEIS ADVISER ON TRUSTS.

During his conference with the house judiciary committee the president made it clear that he has no trust bill of his own at this time. He has been discussing the matter with the attorney general and with Louis D. Brandeis of Boston, and it would not be surprising should these men be asked eventually to formulate a measure. In this case, the president will endeavor to bring congress around to his way of thinking, and in view of the control he has of that body, it is evident his ideas will prevail.

Whatever trust bill may be reported by the judiciary committee, it will have the approval of the president, and in order to get it through the house and senate, the power of the caucus will be invoked. The president will insist that early action is desirable in order to prevent business depression.

Eastern Hearings in Government Anti-Trust Suit.

At the Baltimore hearing in the government's anti-trust investigation in the case primarily involving the Bell companies in the Pacific Northwest, four witnesses were examined. Dr. A. R. L. Dohme, president of the Protective Telephone Association, testified that the service furnished by the Chesapeake & Potomac Telephone Co., was more efficient and satisfactory when competing with the Maryland Telephone Co., which it subsequently absorbed. H. Findlay French, counsel of the same association, declared that the chief grievance of telephone users in Baltimore was the abolition of the flat rate, so far as the business service is concerned.

On December 4 the hearings were transferred to Philadelphia. F. C. Redfield, of Syracuse, N. Y., formerly a clerk in the office of the general manager of the New England Telephone & Telegraph Co., and now employed by a telephone supply house, submitted in evidence a score of copies of vouchers used, it was alleged, by the New England Telephone & Telegraph Co., in paying for advertising. The witness testified that on many occasions the company dictated the policy of newspapers by giving them advertising, and that editorials attacking rival telephone companies or boosting the New England company were prepared in the office of the general manager of the Bell concern.

All the vouchers drawn for paying newspapers for printing news favorable to the New England company were signed by the general manager and passed by the vice-president of the company, according to Mr. Redfield.

Mr. Redfield testified that in October, 1908, after The Boston Traveler had made an attack on the New England company, and had announced in favor of a commission to investigate the concern, the newspaper was given $1,250 for the publication of an advertisement.

G. B. Rudy, manager of the York Telephone & Telegraph Co., of York, Pa., testified that for many years his company had a telephone connection with Baltimore over the wires of the Maryland Telephone & Telegraph Co. When the contract for this service was made, he said, the Maryland Telephone & Telegraph Co. was an Independent concern. While the contract had two years to run, he testified, the American Telephone & Telegraph Co. purchased the smaller concern and instantly his company was given "rotten" service to Baltimore.

"It became so bad," Mr. Rudy declared, "that with the contract having one year to run, we refused to handle any business from York to Baltimore. Because of this we lost thousands of dollars of business."

William Bagley, who has charge of the Postal Telegraph Co.'s offices in Philadelphia, testified about the service given by the Bell company to the Postal company.

"Since the American Telephone & Telegraph Co. assumed the control of the Western Union Telegraph Co., the service given us by the Bell company is very unsatisfactory," said Mr. Bagley. "The company diverts business of patrons who call us to dictate messages, and turns them over to the Western Union company."

At the hearing on December 5, John A. Howard, of Wheeling, W. Va., told of the sale of the Interstate Telephone Co., of New Jersey, to the Bell system, whereby, he said, competition in Northern New Jersey was wiped out.

On cross examination Mr. Howard said the Continental Telegraph & Telephone Co. was organized to take over all Independent companies east of the Rockies, but went into the hands of receivers. At the time of the collapse, he said, Independent telephone companies in West Virginia, Western Pennsylvania and Eastern Ohio had been merged into the National Telephone Corporation and were about to affiliate with the Continental.

Mr. Howard then told of negotiations, now under way, in which it is planned for the Bell system to take over the companies in the National Telephone Corporation. When this is accomplished, he said, competition in the territory where the National Corporation operates, will cease.

R. R. Boggs, representing the Travelers' Protective Association of America, complained of the absence of Keystone telephones from hotels in Philadelphia. He said the hotels have refused to install Keystone telephones, because the company will not charge 10 cents for local calls.

The taking of testimony was resumed in the Federal building in New York the later part of this week and it is expected that the New York hearings will conclude the direct testimony to be taken by the government.

The Transmission of News by Telephone.

That the telephone may be destined to play a much more important place than at present in conveying news dispatches for publication is the conclusion from a recent test made by long distance wire in South Carolina. The test was made during the meeting at Columbia, S. C., of the Coast Circuit of the Associated Press, when editors of southeastern newspapers were present.

A news dispatch of 400 words was read from the office of the News and Courier, of Charleston, over the long distance wire, by E. J. Wehrley, of the Bell system, direct to a linotype operator of the Columbia State and was put into type without the use, by the linotype operator, of "copy." The message was copied simultaneously in the offices of the Spartanburg Herald and the Greenville News. The idea of the test was conceived by John W. Hammond of the Augusta Chronicle, and this is the first practical test of the plan in the South, and one of the first in the country.

New Exchange for Fort Sam Houston.

At an expense of $17,000 the telephone system at Fort Sam Houston, in Texas, has been entirely rebuilt, a new switchboard installed and all wires carried in underground cables. All barracks, quarters, offices and buildings at the post have been arranged with telephone connections and a central office has been constructed where three shifts of men operators are employed.

Analysis of the Telephone Possibilities of Chile

Superiority of the Telephone over the Telegraph—Some Statistics of the Telegraph System of Chile—Advantages of Using Telegraph Circuits for Telephone Purposes—Comparisons with European Systems—Methods of Developing Telephone Traffic in Chile

By Béla Gáti

All South American people, especially "the Chileans, from the time of Ambrose O'Higgins, have recognized that nothing contributes to wealth and progress so much as improvement in communications."*

The simplest and cheapest communications are formed by the post, telegraph and telephone. In the details of these methods, there are great differences. The post requires a time period of days, if not weeks, for the answer; the telegraph has a delay only of some hours. It can be said that the telegraphic answer always arrives on the other day, which may well be appreciated in the countries of the *mañana* (tomorrow). The telegram sent today then, is surely answered by tomorrow.

Developments of Chile's Telegraph System.

The Chilean government realizes this and at the present time "the majority of the telegraph lines in Chile form, like the posts and railways, part of the industrial services of the state. In the telegraph service the government's object is to favor general interests, and to this end it carries wires to, and establishes offices in places where no private undertaking would find it profitable to maintain them. In this way the telegraph system of Chile has been extended until it permits of communication between the most distant and out of the way cities and towns, from Tacna to Chiloé, at moderate and uniform tariffs. At the present time (1912) there are 9,400 miles of national telegraph lines in existence, without reckoning those which belong to the railways."*

Chile extends from 17° 25′ south latitude to 55° 58′ 40″ south latitude, or, roughly, 2,630 miles.

"As a result of the extended coast line, and owing to the undeveloped state of the country, Chile is for all practical purposes a series of islands, and communication by land is difficult where not impossible. In many cases the various ports are as much isolated as though they were actually cut off from the mainland."†

We know from Julio Perez Canto's excellent book, that the government has intentions to improve the communication, especially the telegraph, but it has not met as yet with financial success.

Chile being a member of the Postal Union, figures of the telegraph system are given in the statistics of the Bureau International of the Union Telegraphic. In telephone statistics, Chile has not taken a place as yet, because the telephonic service does not belong to the state. The principal telephone concern, the "Chile Telephone Co." having a capital of £300,000 ($1,500,000), does not believe it necessary to give data of its telephone statistics.

According to the above mentioned statistics of 1910, Chile's net income from the telegraph was 2,210,609 francs ($426,650) and the expenses were 3,020,993 francs ($583,050), which shows a deficit of 810,384 francs ($156,400).

In this respect Chile resembles quite conspicuously the European governments, where the telegraph administrations also work with considerable deficits. However, the Europeans have no wish to recognize the considerable sums expended, and in the general budget of the state expenses, is found everywhere the statement that the telegraph being united with the post, the separate expenses of the telegraph can not be determined. In this respect Chile acts more frankly.

In detail, the income and expenses are as follows:

Income.			
Correspondence interior	1,871,877	francs	($361,272)
Correspondence international	336,854	"	(65,015)
Diverse incomes	1,878	"	(363)
Total	2,210,609	"	($426,650)
Expenses.			
Personnel	2,339,580	francs	($451,538)
Maintenance of the lines and offices, material and works	681,413	"	(131,512)
Total	3,020,993	"	($583,050)

From a certain point of view, it is sure that in all countries, the maintenance of the telegraph lines and offices have an investment character. For instance, the wooden poles are replaced with iron ones; iron cross arms are mounted; the office equipment then seems better and fit for more years of use than before, and so the sum of 681,413 francs ($131,512) can be stated as some form of investment. "Generally speaking, the Chilean government attempts to undertake with the ordinary resources of the country, public works of considerable importance, which should have been provided for with extraordinary resources."* Probably this is the case with the telegraph expenses also. Deducting this sum of 681,413 francs ($131,512) from the expenses, the telegraph income nearly balances the telegraph expenses, thus indicating a deficit less probable.

It can be stated that the telegraph is not held in favor by any people of the world. In private life, men use it seldom, the telegram usually being a herald of some one dead, or at least of some misfortune, accident, etc. Hence the larger part of the public is frightened by telegrams. The South Europeans, just as the South American people, do not like the telegraph business at all, and so the telegraph traffic is developed from the commercial men of the nation and from the foreigners.

Quite different is the case with the telephone. We get the answer at once; our affair, or business, is settled in a moment. Anyone once accustomed to the telephone, has telephoning as a habit and can not very well be without it. There is no *mañana* (tomorrow) question at all.

South Americans and the Telephone.

The Spanish language is well adapted for telephoning, having many and nicely accentuated syllables, besides, many long words and well-rounded out formations in the sentences. If any letter sound does not arrive at the receiving end of the line, the speech can still be comprehended. Therefore, all the larger cities of South America have good telephone nets.

The building of the toll telephone circuits is very expensive, and there is no doubt Chile's present condition does not very well permit these expenses. The ordinary and extraordinary revenue for the year 1911 was estimated at $82,600,000

*Chile; by Julio Perez Canto, pages 82, 206, 71.

†Central and South America; Emigrant's Information Office, p. 101.

in gold (pesos of approximately 36½ cents or 18*d*) and $175,700,000 in notes (pesos of approximately 22.3 cents or 11*d*) or together £14,247,916, and the net expenditure at $42,500,000 in gold and $238,900,000 in notes, the equivalent of £14,137,083, which leaves an estimated surplus of £110,833."* Chile pays about ¼ per cent. of her expenditure to cover the deficit of the telegraphs. The toll lines would cost a considerable sum and as the state life has so many sides—not a hundred-fold but a thousand-fold matters—it is not allowable to have a hundredth part of the incomes given for the telegraph and telephone purposes. It can be said that without far extending local exchange systems, the toll circuits do not show themselves profitable. Their cost is large, therefore in most cases the toll rates are prohibitive.

Fig. 1. Oscillograph Records of Sound "A" at Receiving Point by Van Rysselberghe's Old Method.

To organize a good profit-sharing toll circuit system, a very low schedule of rates must be offered and the circuit advertised, as is customary in the United States. It must not be feared that the telegraph traffic is decreasing, for Chile had, in 1910, 15,096 kilometers (9,380 miles) of telegraph lines, and 28,411 kilometers (17,400 miles) of wires on these lines. These might be converted into metallic telephone circuits, 14,000 kilometers (8,700 miles) in length and into one wire telephone circuits with earth return, 1,000 kilometers (620 miles) in length, making a total of 15,000 kilometers (9,320 miles) of telephone circuits. If these circuits should be newly constructed, the expense would be about 15,000,000 francs ($2,895,000).

The transforming of the telegraph wires into circuits for telephone use does not cost 10 per cent. of this sum; that is, the cost of the conversion would be of approximately the same amount as the present telegraph deficit.

The following figures show briefly what revenues the transformed telegraph circuits can produce.

Germany had in 1910, 575,838 kilometers (358,500 miles) of toll wires, having an income of 59,896,622 francs ($11,560,000); that is, each kilometer produced a total revenue of 104 francs ($20.07) yearly.

Austria had in 1910, 54,698 kilometers (33,950 miles) of toll wires and the income was 5,502,988 francs ($1,062,077); that is, practically the same as above, 101 francs ($19.50) per kilometer yearly.

From Chile's 28,000 kilometers (17,400 miles) of toll wires an income of 2,800,000 francs ($540,400) yearly may be expected, or reckoning the difficulties of the railway and land communications, more telephonic use of the wires may be anticipated, making the total about 3,000,000 francs ($579,000) yearly. This sum would be enough during the first year to cover the expenses of the transformation and to wipe out the telegraph deficit of the telegraph (and telephone) administration. The following years, instead of a deficit of the telegraph, amounting to ¼ per cent. of the total state expenditure, there would be a net profit of another ½ per cent. to the state's income.

It is thus seen that the prospect is a very brilliant one, and besides the transforming improves the wire efficiency as the use of the telegraph and telephone is possible at the same time, neither of the branches causing the slightest effect on the other.

For comparison, two oscillograph records are presented showing the pictures of the arriving currents, when at the sending point of the telegraph circuit, the sound *a* (*a* as in call) was pronounced before the ordinary transmitter. The line, transmitter, speaker, were the same in both demonstrations, the method of insertion alone being changed. Of course, using strong current transmitters, the current becomes much larger.

According to the writer's experiments on iron wires, the speaking distance, without loading the circuit, is 200 kilometers (124 miles). Loading the circuit with Pupin coils, or better still with shunted coils, that is, induction coils and inserted between the two telegraph wires, 500 kilometers (311 miles) distance is yet well allowable. The inconnected telegraphic apparatus is compensated and does not cause any difficulty.

On copper wires, the distance is still greater. The transforming does not cause any difficulty, only good high-frequency measuring devices, such as a barretter, are to be employed. The measurements are simple enough and can be made with pointer-galvanometer (the so-called micro-ammeter).

Chile has now 352 telegraph offices according to the Postal Union's statistic; Julio Perez Canto states, that there are more than 1,000 post offices. Thus it is seen that only a third of the post offices are equipped with the telegraph. Each post office may have a telephone office, too.

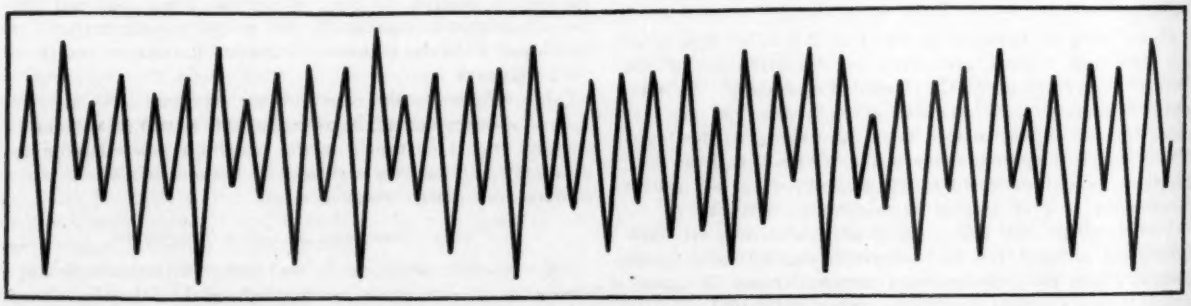


Fig. 2. Record of Same Sound by Gati's Modern Method.

Europe has a vexatious way of treating the operators of the post offices, using them almost without extra pay, as telephone operators. Chile must be more clever. Allowing some percentage of the telephone income to the post and telephone office operator, the net profits per

kilometer circuit would be surely more than in Germany or Austria; hence the government will receive a larger income.

In Hungary, the newspaper men pay only half the regular toll rate during the night; in some newspaper offices the news is collected by telephone and dictaphone (parlophon or phonograph-like apparatus). This makes the gathering of news cheap and easy. The news collected in this way is more direct and better satisfies the desires of the modern reader. Chile could introduce this method also and gain thereby a considerable night traffic, thus saving the circuits from idleness during the night. The chief commercial traffic is done by telephone during the forenoon, so cheaper afternoon rates could be made for the public authorities. It is certain that in this manner the provinces and the colonization territory, the municipalities and the many other authorities would pay a considerable amount for telephone connections, which hitherto did not figure in their budget, but the improvement of the general management, a good rapid development of the distribution and service represent a value, which can never be overestimated. Nothing has been said about the conditions, which make themselves crucial in point of view of the military, especially in war.

In the Panama Canal there is already an investment of thousands of millions of francs (not counting the sacrifices of life). It is a duty of the surrounding countries to prepare themselves for that great event, for the opening of the canal. Chile must also improve her communication, in which matter the writer had the honor to give some advice, relating to telephony.

Missouri Rate Increase Must Await Investigation.

The Public Service Commission of Missouri has declined to put into effect an increase in telephone rates desired by the Southwestern (Bell) Telegraph & Telephone Co., and announces that a thorough investigation will be made of that company's system of bookkeeping and its financial relations with the parent corporation, the American Telephone & Telegraph Co. The commission will then render its decision.

The schedules filed by the Southwestern Telephone & Telegraph Co. with the Public Service Commission of Missouri, provide for an increase of rates for unlimited business service in Missouri. The new schedule for St. Louis is a slight modification of the rates suspended two years ago under agreement with the St. Louis Public Service Commission pending an investigation and report.

The greatest increase provided for in the new schedule is in the case of unlimited direct line service. The increase in this instance is from $6.50 a month or $78 a year, to $10 a month, or $120 a year. The total amount of the revenue to be derived from the increase is estimated by officials of the company at $157,000 per year. Of this amount it is stated it will require $120,000 to meet the expense due to increase in operators' wages, decrease in operators' hours and appropriations for employes' pensions, disability benefits and insurance which became effective in the present year. The balance remaining to be carried to the net earnings of the company would be $37,000.

In filing the schedules, the company states that the report of the St. Louis Public Service Commission, which recently was submitted to the Municipal Assemply, clearly shows that the company is entitled to a much larger increase in revenue, but that it feels that in order to carry out in good faith the agreement with the city of St. Louis, the schedule of rates as filed with the state commission should be put into effect for at least a sufficient time to give the rates a fair trial.

No change in residence rates is provided for in the new schedule. A comprehensive schedule of business message rates, which are materially lower than the present message rates and will enable the smaller users and a large number of the unlimited business subscribers to secure service at the same or lower cost than at present, is included.

Under the new message rate plan a subscriber who uses fewer messages during the year than he contracts for, will receive a refund, making the cost of his services meet his actual use down to the lowest rate of $45 a year for direct line, and $39 a year for two-party line, service. The message rate plan now in effect and the suspended rate plan, provide for no refund, and the number of messages contracted for is a guaranteed minimum.

The new schedule will affect the cost of service as follows: 42,562 stations, or 66 per cent. of the total number of stations, cost of service unchanged; 3,525 stations, or 6 per cent. of total, cost of service decreased 75 cents a month; 18,260 stations, or 28 per cent. of total, cost of service increased 88 cents a month. These are average figures and in individual cases the decrease or increase will vary from practically nothing to amounts in excess of the average figures.

In the case of private branch exchanges, with two trunk lines to central office with 3,000 local messages a year, the rate is increased from $14.75 a month to $15.25 a month. The rate of $2.50 a month for additional telephones remains the same.

In the case of the private branch exchange, with two trunk lines from central office and unlimited service, the rate is raised from $19.50 to $27 a month. The charge for additional lines from central office is increased from $6 a month to $10 a month and the cost of additional telephones remains the same, at 50 cents a month.

For the small users of telephones a sliding scale is provided so that they may materially decrease their present charges for the service.

In the case of persons who use a direct line service, with maximum of 600 messages a year, and a charge of four cents for each additional message, the rate of $3.75 a month remains the same, but the number of messages is increased to 720.

Those who are limited to 800 messages a year and charged a rate of $5 a month, are increased to 1,320 messages a year and charges $5.25 a month. Additional messages remain the same at three cents each.

In the case of persons who are limited to 1,800 messages a year and charged a rate of $6 a month, the number of messages is increased to 1,920 and the rate to $6.50 a month. Additional messages remain the same, at 2 cents each.

The two-party rate of $3.25 a month where patrons are allowed 600 messages a year will remain the same, but the limit of messages will be increased to 660 a year. The charge for additional messages under this character of service is four cents each.

Sale of National Telephone Co. Property.

All the property and assets of the National Telephone Co., of West Virginia, will be sold at public auction at the court house at Wheeling, W. Va., on December 31, following an order by Judge Dayton of the federal court, in the case of Cyrus Huling against the company. T. S. Riley and L. J. Bayha, who were named as special commissioners, were compelled to furnish $100,000 bond. The sale will bring to a close the long-fought telephone case, which became a complicated legal tangle.

The Christmas Rush of Telephoning.

The Home Telephone Co., of Ft. Wayne, Ind., reports that the Christmas rush of telephoning started two weeks earlier than usual this year. This is believed to be due to the fact that subscribers are adopting the "shop early" idea.

Shattered Idols

The New England Investor—Sucker Serum, Etc.

By J. C. Kelsey

According to Aesop, the well known fable writer, a countryman, a kindly man, seeing a viper in his path, apparently frozen to death, picked him up and warmed him in his bosom. When the viper recovered his faculties, he promptly bit the compassionate countryman, who of course, promptly expired.

Thus we have the injunction not to warm a viper in your bosom. The viper could not be blamed; his nature was simply to bite, to poison, to kill.

Years ago a modest little railway ran from New York to New Haven and Hartford, thence to Providence and Boston.

The New Englanders picked it up, invested their money in it, and warmed it in their bosoms. This railway viper repaid the honest New Englander by stinging him for just $350,000,000.

Not all railways, picked up and warmed by investors, do this deadly act in return, but they are different. They have no monopolistic taint.

The little railway reaching from New York to New Haven and Hartford, thence to Providence and Boston, wanted to reach out to Albany, Springfield and Portland.

It became ambitious. It sighed for more worlds to conquer. In other words, the railway viper was growing into a dragon.

The modern dragon is a monopoly, with traditional horns and red fire flaming from its nostrils.

True to monopolistic instinct, the New Haven road, after conquering all the worlds about it, became stricken.

Monopolistic diseases were at work. No doctor had the skill or courage to make a diagnosis. Initiative, discipline and efficiency took flight.

In place of these healthy organs, there were arrogance, stupidity and supineness—and the monopoly disease went further. It bit the New England investor, as monopoly will eventually bite every investor.

New Haven railway stock now stands at $75 per share.

This may not mean much to you. Most of us never heard of this railway, much less to ride in its wooden monopoly coaches, but the New England mind got to comparing the Rock of Ages with the New Haven road.

As a result, churches, colleges, trustees and investors poured their money into the coffers of this railway as fast as they could beg or borrow it—and the average price the New Englanders paid for this Rock of Ages stock, was $250 per share.

New England people lost $350,000,000 by taking this monopoly dragon to their bosom.

It has made well-to-do people needy. It has reduced aged people to poverty. It even ruined rich and prosperous families.

No one seemed to escape its withering blight—that is, the thrifty ones. It is one of the most cruel outrages in the world's history.

Men have been burned, women buried and children sold into slavery, but the process was merciful when compared to the deed of the monopoly viper of New England.

I can't say that I have much sympathy for the New England investors, heartless as it may seem. When they had things their own way, they did not sell stock.

They burned undesirable ones at the stake, or drove them naked into the wintry woods without a compass.

It is a long lane that has no turn.

New England danced and is now paying the inevitable bill of the fiddler. New England made and desired a monopoly bed—and now they are lying in it.

They believe in monopoly heart and soul. They believed it at Salem Hill, where successful competitors were accused of witchcraft and destroyed.

They trust in monopoly; they cannot see how competition can make a dollar. They cannot see that competition means economy and initiative instead of monopoly.

It is monopoly that is extravagant, careless and shiftless. It is monopoly that is cowardly, that strikes in the dark, and then in the back.

New England invested in and capitalized cowardice.

They were afraid to put their money on a man willing to race with his neighbor. They preferred a man who would sicken his competitor's horse before the race.

To them it seemed safer, even if not according to the precious golden rule.

And they lost! They are to blame themselves. They deserve no sympathy. In their ignorance they demanded a monopoly, not knowing that barnacles attach themselves to the monopoly ship which can never be scraped off.

Monopoly is a white corpuscle. Competition originates red corpuscles.

Within us, the red corpuscles stand for health, life and hope. When the white corpuscles get the ascendency, we are done.

In some parts of the South, the hook worm enters the body, swings itself suspended from the lymphatic glands, and destroys the red corpuscles.

The patient turns pale, grows languid, loses ambition and perishes miserably. In fact he is glad to do so.

Monopoly may well be called the hook worm of industry.

Today the New Haven road is willingly listening to the government's suggestion of a way to restore competition in New England. Ten years ago this concern would have arisen in haughty wrath and fought the government through ten rounds of supreme courts.

It strikes us curiously how such a giant could fall to such depths of humility in such a short time.

It is a modern miracle. The story of the loaves and fishes pales into insignificance.

It has been pretty hard for the big fellows lately.

The big ship Titanic, right in the middle of the trouble, carelessly ran into an iceberg.

It was a fine big vessel, and had all sorts of human-made contrivances, but it floundered around and sank—just as a rowboat.

It reminds us of the New Haven—a man-made monopoly in a country so thoroughly trained to monopoly, too.

Yet it sank—gurgling and whining, and sending out S. O. S. calls for the relief ship Competition.

New England consequently has never been a place where Independent telephony got much sympathy. New England in-

vestors also look upon the Bell interest with the same feeling as they have for the Rock of Ages.

The masters of American Telephone had better heed the storm signals sent out for the New Haven trouble. They have a fearful responsibility.

New England can't stand another monopolistic fiasco. They are paying dividends upon equities in the various telephone companies.

Churches, colleges, trustees and investors, etc., have poured their money into the coffers of American Telephone and have never asked a question as to what they were buying.

Now, when a New England investor buys American Telephone stock, what does he really buy? Can you tell what he really buys?

Why, he merely invests his money, believing it will always pay him eight per cent. Aside from that, he can't tell—I never saw a man who could.

Speaking of American Telephone investment, I want to turn to New York City. The New York Telephone Co. has always made a desperate attempt to hide its enormous earnings by taking in adjacent property.

Lately the fight has been growing hot. The city proper must be separated.

Now the New York Telephone Co. has practically the same number of telephones as the Chicago Telephone Co., and the Chicago Telephone Co. has practically $30,000,000 of property.

The New York Telephone Co. filed the following statement:

Telephone plant	$45,000,000
Tangibles	9,000,000
Intangibles—franchise	30,000,000
Going value	10,000,000
Subway	10,000,000
Working capital	6,000,000
Total	$110,000,000

At these figures the Bell company showed a profit of 10 per cent. But these figures met a hard fate.

It seems that even the philanthropic Bell people cannot conceal their fondness for a monopoly franchise. Anyway they put it in at $30,000,000. I think this was the silliest and most childish thing ever done by any Bell official.

Then they added $19,000,000 for good measure!

The New York railway commission? Well! They just laughed, and threw $49,000,000 right out of the window. Don't you wish you had been there?

This left this company with $61,000,000, which is a tidy sum of money.

Has the New England investor put his hard-earned money into that rejected $49,000,000? Is that rejected $49,000,000 a part of the bookkeeping scheme to cover up the purchase of competing plants at extravagant prices?

Some day we will know whether there is some "sucker serum" working among the telehone investors of New England.

The Bell attempt to hide the New York Telephone Co. by mixing it with the outlying territory is a thinly veiled device to hide discrimination.

I was surprised, in the Chicago case, to observe the bold request of the Bell to charge high rates in Chicago because it was losing money everywhere else.

That is exactly what happens in New York. New York City subscribers are paying the bills of the losing communities.

Of all the vipers, discrimination is the most deadly.

I spent a few hours in Grand Rapids, Mich.

I fully realized the deadly horror of this word, discrimination. in its rankest form.

Bell rates in Grand Rapids, a city of 125,000, are ridiculously low.

In monopolistic Michigan cities of even 20,000 people, the rates are higher. But someone claims that if the Bell company is compelled to charge fair rates in Grand Rapids, it will be put out of business.

In other words, the poor Bell company in Grand Rapids would undergo the horrid pangs of confiscation, if everything were equal.

I want to ask you this: If the order compelling the Bell rates to be adjusted properly would bring about confiscation, what will happen to the company that is defending itself against its cut-rate enemy? Simply confiscation—nothing else.

As a matter of fact, there ought to be enough business courage in the Bell bosses to make themselves a one-price house. They would do it if they were as strong and powerful as they are trying to make their New England investors think they are.

There is nothing so deadly as an institution with a pliable scale of prices.

If the authorities of Michigan continue to stand helplessly by, influenced by the fear of confiscation, let them fully analyze what this idleness means. It means that the present successful company will face eventual confiscation, being undermined by the price-cutting one.

The one entitled to protection, the survivor of the fit, is the one at present without proper recourse.

Discrimination is the principal disease of monopoly. Apparently it is an advantage—a cowardly one to take.

In real life, it is a disease, sapping the life of the whole organization—another New Haven disease, spreading relentlessly, as a cancer.

Taking advantage of discrimination is as thoughtless as allowing the baby to play with the open lye can, or leaving mercury tablets lying around in your medicine chest. It is alluring to the baby for a while, but what follows we well know.

If the Bell company really meant business, and had the New England investors' interest really at heart, it would abolish its system of discrimination as quickly as a diseased appendix.

The operation would possibly be bitter for a while, but how good and strong the patient would be afterward!

It is a pity that the last surgical congress did not discuss means of operating upon the deadly malady.

The whole world seems to have taken up the cry against monopoly. The German government has openly encouraged it. Today its credit is the poorest of any first-class nation.

They had a notion that prosperity began at the top. The surest thing you know, is that every healthful and successful thing begins at the bottom.

Big fortunes are no longer considered as a mark of admiration. The world knows that most big fortunes are really water-common stock—and no real equity in anything, except when suckers buy it.

The New England investor seems to have many Mexican investments.

John Hays Hammond, a personal friend of Taft's, made a speech at Worcester: "A nation which does not protect its citizens and investors abroad, is unworthy of the name of a nation."

And then he shed tears for the honest workingman. encouraged to locate in Mexico, who was forced to flee and lose his savings. Then he apparently got mad and said he would

never invest another dollar out of America as long as William Jennings Bryan is secretary of state.

I have at last found a good use for the universally loved Bryan—keep him secretary. It would be a grand thing if investments were kept in America.

But the "sucker serum" never runs out. People like to send off for things, and, on the same principle, invest money far away and surround their investment with the halo of romance.

There is little romance in Mexican investments these days. Give us Bryan permanently.

Just as the government has bank examiners to govern banks, so should it have industrial examiners for companies and corporations that sell securities to the public.

If a bank is found insolvent or crooked, it is promptly shut up. Industrial concerns should be given the same close and intelligent scrutiny.

It is interesting to note President Farrell's defense of the custom of selling goods to foreign points cheaper than in America. He is president of the United States Steel Corporation.

Personally, I see no justification in it. It is my experience that European prices are higher than ours—especially in telephone devices.

But the real reason he gives for cutting prices abroad is this: "The cut is forced by competition."

This is an interesting reason. You can draw your own conclusions.

You can see the disease in every big monopolistic concern.

There will be many monopoly fiascos of the New Haven variety before you and I pass away, and New England will bear the brunt of it. They still have more idols to smash.

MORAL: Monopoly has no first mortgage on the Rock of Ages.

Telephone Service During Great Flood In Texas.

Sunday, November 30, proved to be one of those beautiful days for which Texas is famous, but as the sun began to set in the west, the sky became overclouded and by night torrents of rain fell, accompanied by thunder and lightning. The storm continued almost incessantly for three days and four nights.

The storm seemed to cover a very wide area, with Waco as a central point. The Waco Creek rose very rapidly and overflowed into the residence section of the southwestern portion of the town. The Brazos River, which ordinarily is a stream about 500 ft. wide, with only a few inches of water in the summer time, rose to a height of nearly 40 ft., or more than three feet higher than ever before known in the history of the oldest inhabitants.

The bulk of the flood came down in large banks from two to five feet high, so that in a very few hours the river was nearly two miles wide, and overflowed the major portion of East Waco, formerly the shopping center for Waco, and familiarly known as "old town."

The long distance telephone lines were used to considerable advantage in keeping the city officials of Waco posted in regard to the rise of the river to the north, so that it was possible to notify the people in advance and permit the salvage of much merchandise and the saving of many lives, which might have been jeopardized, if not lost. Practically all of the stores in East Waco had time to move their goods away from the threatened district, or have them removed to upper stories where the water fortunately did not reach.

The fire department, militia and city officials rendered the very best possible service during the flood and deserve great credit for the manner in which they fulfilled their several duties.

At the exchange of the Texas Independent Telephone System, which is by far the largest one in Waco, the scene was one which will never be forgotten in the history of the exchange. There are 25 local positions equipped with 15 pairs of cords each, a total of 375 pairs, and times innumerable, during the rising and crest of the flood, absolutely every cord on the board was in use and calls still coming in. It is estimated that each position on the board, during the peak of the load, carried an average of 500 calls per hour, this calling rate lasting for seven hours and necessitating 10 additional operators to take down completed connections. The amperage kept very steady for several hours at 63 amperes, taxing the capacity of the charging machines and battery to their utmost.

The chief operators, both toll and local, with their supervisors, were on duty almost the entire night of Monday and all day Tuesday, as also were many of the line operators, and it is to their credit to state that under the severe strain and with an impatient public, all anxious for information, complaints were extremely few and friction between company and public absolutely at a minimum. Many of these young ladies were taken out of inundated homes where the water was several feet deep. Leaving their families to do as best they could, they went to their posts of duty without a remonstrating murmur.

Practically every employe of the traffic department, from the superintendent down, was on the job night and day in an earnest endeavor to serve the public in the best manner possible under the circumstances. Co-operating closely with the operating department was the entire plant force, from the superintendent of plant down to the groundmen, every man ready and willing to do his utmost, to keep the service going. It was necessary for the men to put themselves from time to time in dangerous positions, having in many instances to swim to get important telephone lines into operation. They also co-operated valiantly with the city authorities in clearing debris and other obstructions at the bridges, which enabled the telephone companies and others to keep up communication with the flooded district.

The local plant fortunately did not suffer so much damage, but the toll lines were washed out in many places, and only with the able assistance of the plant department was it possible to keep up constant communication by telephone with the outside world. The Independent company was warmly congratulated by the telegraph companies for giving them simplex circuits over the toll lines when the telegraph lines were down and out.

Austria Active in Telephone Development.

A new telephone cable has lately been completed between Vienna and Dalmatia in Austria, according to the Telegraphen and Fernsprech Technik. The line includes not only a land section, but also several submarine sections, linking up a number of islands in the Adriatic Sea. Ordinary bronze wire is used for the landline, and continuously loaded cable for the under-water portion of the system. Tests recently made between Vienna and Sarajevo, a distance of about 875 miles, were completely successful.

The government is reported to be preparing a vast telephone programme, which will take four to five years to realize, and involve an expenditure of £3,750,000. In order to avoid raising a public loan, the government will invite the Austrian contractors—cable and telephone instrument companies, copper works, etc.—to finance the scheme by loans, which the latter will contract with local banks on the security of annual government repayments spread over a period of 20 to 25 years.

The Rejuvenation of the Craneville Telephone Exchange

A Serial Story Begun in the August 16 Issue, Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery Metallic System and Later to Common Battery

By Paul Hamilton

"Well, boys, how many of the new protectors caused trouble during the storm last night?" Mr. Barrows inquired, as Big Frank and Germany met with him Thursday evening.

"Out of the 37 we installed we found four grounded solid and three others just enough to interfere with the bells," Frank replied.

"And a couple more drops in the board came open, too," said Germany.

"The installation of the arresters here in the exchange will probably be finished by Saturday night, so we won't have much more damage of that kind," Mr. Barrows answered.

"One of the fellows working on the arresters was telling me about a fuse and heat coil made up together," said Frank. "Did you ever see one?"

"Yes, Frank, I have seen them. It is a question in my mind whether there is any economy in their use. Of course you know that heat coils instead of grounding the line, automatically open it."

"You save running a ground line then, ain't it?" queried Germany.

"Not if you are using carbon blocks. You must use a ground wire for them."

"There might be a saving in replacing coils and fuses at the same time," Frank suggested.

"In a majority of cases there is saving of neither time nor material; instead, there is usually a loss of the latter. As you know, the protector provides for three distinct principles—the carbons for high voltage or pressure, the fuses for high amperage or current, and the heat coil for sneak currents too weak to ground the carbons, or to open the fuses. There is a happy medium, we will say, where any two of the three devices will operate, and in such cases you will find that the carbons and coils act together more often than the fuses and coils."

"And does the whole shooting match ever go off at once?" Germany inquired.

"Sometimes, but not often. Let us say, for instance, that one of the electric light wires falls across our lead. It may rebound and give a second, sudden contact, grounding the carbons, or the current may be reinforced by what is called a static charge on our wires and also ground the carbons. The current being less than seven amperes, the fuse will not be blown. Now you see, we have the sneak current going to ground through the heat coil and carbons. The coil will heat and ground on the arrester bar, offering a path of less resistance than through the air gap of the carbons. Cases of this kind will occur more often than those where the fuses and coils blow. A current, heavy enough to open the fuse, will do so before the coil can heat, and with the circuit open, no further damage can occur."

"I see," said Frank. "When we have a fuse blown, the heat coil is liable to be good, but in the combination kind it has to be changed anyway."

"You have the idea."

"I'll tell the fellow that, and see what he says."

"I intended to take up inside wiring to-night, but we will postpone it until next week, as there are several other things I wish to talk about," said Mr. Barrows, closing the looseleaf portfolio before him and drawing a memorandum book from his pocket.

"Germany has finished the wreckage upstairs and can start out with you tomorrow, Frank. I've been looking around a bit and I have several cases noted here, which should have immediate attention."

"Mr. Willis told me today that the plasterers are about ready to go ahead on his house."

"Oh yes! I was going to mention that. I was up there today. The electric light men were putting in conduit for their wires."

"Is that what you call the iron pipe they use?" interrupted Germany. "Ain't it the same like water pipe?"

"That is what it is called, and it is far different from water

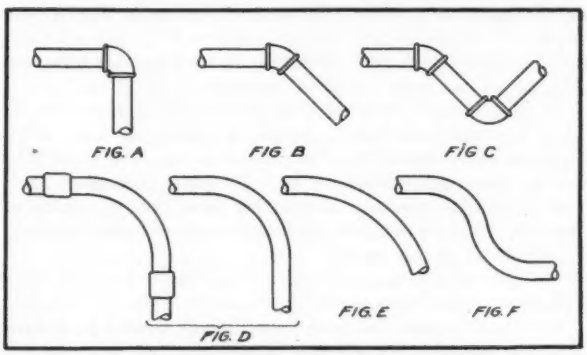


Fig. 33. Comparison of Bends—Steam Pipes and Electric Conduit.

or gas pipe. It is of much softer composition and can be, easily bent. You will notice that steam pipes, water pipes and gas pipes are never bent, but all turns are made by using elbows and connectors, threaded and screwed together like this (Fig. 33, *A, B, C*). The same turns in electrical work are made like this (Fig 33, *D, E, F*)."

"I noticed the pipe the electricians are using is black, while the water piping is lighter colored," said Frank.

"Yes, that is generally the case, because the conduit is soft iron while the water pipe is compressed, and usually galvanized steel. The iron conduit will rust quickly and is therefore given a coating of paint and hard varnish, or enamel, which, however, does not add to its stiffness."

"But the con-du-it could be put together like water pipe easy all right," commented Germany.

"You couldn't very well pull your wires around a square corner, that is why short bends are avoided. By the way, the word is pronounced as if spelled 'kon-dit.'"

"Now, about Mr. Willis' house: I asked him to give the electrician the exact location where he will want the telephone and have him run a piece of conduit from the basement. The instrument, when in place, will conceal the opening in the wall, and, as the basement is not going to be sealed, the wiring will be but a small job when he is ready for the telephone."

"Why can't we run the wires in with the electric light wires? Their wire is insulated more than ours?" Frank inquired.

"It is not safe to have our wires in contact with theirs, even though the insulation is good. Insulation deteriorates and a heavy current or voltage is likely to break it down

any time and make us trouble. The inside wiring is inside the protector, you will remember. There would also be the liability of trouble from induction."

"And do we pay for the con-du-it, already?" was Germany's query.

"No, it is up to the subscriber to put it in or not. The expense is so little that it is a small matter if done while a house is under construction, besides it obviates any chance of marring the finished walls in getting the telephone wires in after the house is finished."

"But not always does a man want his telephone where he says to put it. Then the 'kon-dit' is in the wrong place," Germany observed.

"In many cases in residences, that is true. In Mr. Willis' case, I think he has selected a permanent location. It is not always a good plan to bring the conduit out on the wall—it is better to have it come out behind the picture molding. From there the wire can be concealed and carried to a point directly above where the instrument is to be located, and then finished behind the plaster. But we will cover that carefully next week."

"You have had more or less trouble at Schroeder's, haven't you, Frank?" the proprietor continued, referring to his note book.

"I should say I had! His line is always in trouble and I don't see any help for it," Frank replied.

"I was down to see him about another matter and he gave me the full history of his troubles. I went down into his cellar and looked at the wires. It is a wonder to me he gets any service at all. I talked conduit to him, but he said he wouldn't do anything now, for he expects to tear out the floor this fall and put in concrete under the front path and under the ice box."

"It has always been as wet as the river down in that cellar," Germany volunteered.

"For that reason, we must make special provision to protect our service," Mr. Barrows replied.

"That will mean additional expense on Schroeder's telephone," said Frank. "Will he pay it?"

"We cannot expect him to do so. We cannot demand of each subscriber ideal conditions. Schroeder's building is there. He wants service We cannot refuse to give it to him according to our contract, because his cellar is in bad condition. Our responsibility goes a little farther than that. Many of his customers are also subscribers and demand connection with his place.

"I see him, just like a wheel going round," Germany broke in.

"Cases similar to this have brought out many experiments. Even iron conduit has been found to be unsatisfactory in some cases, especially where several joints are necessary. The joints are not usually made moisture-proof and rust

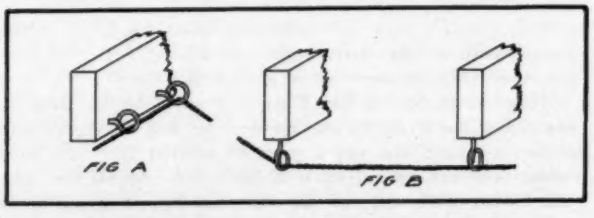


Fig. 34. Use of Bridle Rings for Supporting Wires.

soon sets in. The corrosion eats through the insulation of the wires, causing trouble. Oftentimes before rewiring was decided upon, I have seen the wire so weak in several places that it could not be drawn from the conduit. That, of course, made the conduit useless. The insulation becomes damp all through the pipe and adheres to the rusted sides. It is better to leave the wire exposed, where it can be inspected."

"I thought that black wire we have is moisture-proof," said Frank.

"It is, under certain conditions, for which it is designed; to make it absolutely waterproof under all conditions would make it too costly for telephone work. If exposed to rain, where water will dry off quickly, it will last a long time without giving trouble, but to staple it to a beam or place it where there is a constant drip or leakage upon it, moisture will penetrate the insulation."

"There is a piece of lead wire in the engineroom at the brickyard," Germany volunteered.

"You mean that lead-covered stuff we put in down there, above that leaky steam valve?" Frank asked.

"That's him," Germany assented.

"Lead sheathing is put on almost any number of wires from two up to 1,200 and even 1,600," said Mr. Barrows. "Two wires in a lead sheath are too expensive for use, except in extreme cases. The expense would not be justified at Schroeder's, neither can we place the wires in contact with the wet beams. We must hang the wire out from the beams."

"We might use knobs," was Frank's solution.

"That has been done with success, but there is a cheaper method that is as good, if not better. In the morning, you boys take some of that No. 18 bridle wire and about 50 half-inch bridle rings. Select your run and screw the rings into the beams. Follow the direction of the beams as much as you can and put the rings in the side like this (Fig. 34-*A*) about 30 inches apart.

"Where the run is crossways of the beams, of course, the rings must be put in like this (Fig. 34-*B*). When the rings are in place, pull the wire in and fasten it with tape at the two end rings only. With knobs, you would have to tie the wire at every knob, besides it would take more time to place them."

"Which kind of rings shall we use, the galvanized or the others?" Frank inquired.

"The enameled rings, to be sure. They are designed for that purpose. Galvanized rings do not serve as insulators."

"Just like threading the needles to 50 sewing machines," commented Germany.

"If you want to do it that way," Mr. Barrows replied. "But you'll find it easier to drop the wire through the opening in the ring left for that purpose."

"That won't take very long," mused Frank.

"That isn't quite all," continued Mr. Barrows. "The wire is brought up at present through a rat-hole and stapled across the front of a partition. You must change that also."

"We thought it would be out of the way there in the corner and not be disturbed," explained Frank.

"And it saved making another rat-hole," Germany added.

"Well! We will not make any rat-holes nor will we use any made by rats," ruled Mr. Barrows. "We will bore through the floor directly under the telephone, using a 5/8-in. bit. Then we will pull the wire through a slide, a piece of circular loom over it, pushing the loom down through the hole. The loom should extend say two inches below the floor, and above far enough to protect the wire from possible mechanical injury from mops, brooms, etc."

"When they mop, the water will run through the hole," observed Frank.

"More likely to come up from the cellar," Germany asserted.

"We will care for both contingencies," said Mr. Barrows. "When you have placed your loom, pull it back an inch or so and wrap it with tape, like this (Fig. 35-*A*), then force it back into the hole. After that, tape the ends to the wire to hold it in place, like this (Fig. 35-*B*). When your job is completed, it will look something like this (Fig. 35-*C*).

"Another little job you'll have to attend to, is to re-wire Rankin's barn. The wires come into the hay loft and the protector is in the office. In some places the wires touch the hay before they reach the protector."

"We didn't want to put the protector in the hay loft," Frank explained.

"You were right in that, but the wires must be taken out

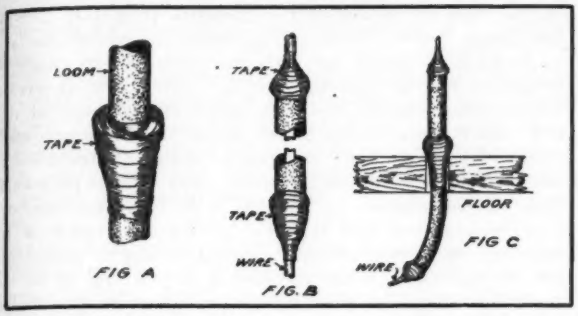


Fig. 35. Holding Circular Loom in Place on Wire.

of the loft, brought down the outside of the barn and carried in at the protector. We will gradually formulate rules for wiring, both outside and inside, as we go on, but these emergency cases we must care for as we come to them," Mr. Barrows announced.

Then, closing his book, he continued:

"This young man who has been attending the board nights wants something to do during vacation. I've decided to give him a chance as a general all around helper. His place here nights will not be hard to fill and he will fit in as an extra hand during the summer."

"He knows a whole lot about electricity. He has helped me some, clearing trouble in the switchboard, evenings," said Frank.

"Well, I guess we'll call it a day's work, boys," said Mr. Barrows in bringing the discussion to a close. "Good night. Leave the door open. I have a little figuring to do before I go and it's a little warm, even if it is raining."

(To be continued.)

Increased Tax Appraisal in Ohio.

Telephone property in Ohio, comprising more than 700 companies, has been appraised for 1913 by the state tax commission at an aggregate of $68,531,490, an increase over the total valuations of 1912 of $2,103,960. Nearly three-fourths of this increase, $1,413,310, will be borne by the Cincinnati & Suburban Bell Telephone Co., whose valuation is boosted from $8,849,690 to $10,263,000. B. F. Kilgour and other Bell officials vigorously protested this increase.

The two Cleveland telephone companies have had small increases, the Cleveland Telephone Co. having been raised $310,310 and the Cuyahoga Telephone Co. a little more than $11,000. The former company's valuation is increased from $6,944,140 to $7,254,450, and the latter's from $4,328,000 to $4,339,350.

The Central Union Telephone Co., the Bell's long distance line, and the Columbus local system, get a healthy boost amounting to almost half a million, from $14,193,010 to $14,676,840.

The United States Telephone Co. is one of the few lines whose 1912 valuation is decreased. The decrease amounts to more than $11,000, from $2,594,650 to $2,583,380.

The appraisement of the Columbus Citizens Telephone Co. is increased from $1,891,730 to $1,918,440; the Ohio Telephone & Telegraph Co. from $4,526,970 to $5,119,800; the Toledo Home Telephone Co. from $2,231,740 to $2,318,810; the Springfield & Xenia Telephone Co. from $509,400 to $513,810; the Akron People's Telephone Co. from $465,600 to $508,270.

Other companies increased are: Amherst Home Telephone Co. from $17,500 to $19,500; Bucyrus, from $131,700 to $143,370; Citizens, of Berea, from $42,460 to $43,090; Conneaut, from $125,550 to $129,160; Elyria, from $216,000 to $219,000; Galion, from $60,000 to $63,750; Home, of Chillicothe, from $229,000 to $230,380; Lima Telephone & Telegraph Co., from $466,400 to $486,000; Mansfield, from $398,920 to $404,210; Middletown, from $152,320 to $166,180; Mt. Vernon, from $275,000 to $277,270; Oberlin, from $59,300 to $61,100; Painesville, from $77,000 to $82,550; Sandusky, from $163,250 to $167,130; Stark County, from $620,320 to $631,360; Wellington, from $41,760 to $47,000; and Willoughby, from $22,600 to $27,000.

Growth of Bell System in Toronto.

The Bell telephone company is installing in the new addition to the Parkdale station at Toronto, Canada, a new 10,000 unit switchboard, of the standard central energy type. The present switchboard will be taken away and the room now occupied as an exchange will be thrown into the new exchange room, thus giving ample provision for future growth to the capacity of the new board. This Parkdale station is one of the existing nine exchanges in Toronto at the present time, and is the third exchange of the same name, showing the growth of that section of the city, which has twice gone beyond the capacity of the board. The capacity of the board just now being replaced is 5,600.

Merger of Companies in Pennsylvania.

Agreements have been approved by the stockholders of the Bell Telephone Co. of Pennsylvania for the purchase of the capital stock, franchises, corporate property, rights and credits of six telephone companies of Pennsylvania, as follows: Enterline-Halifax Telephone & Telegraph Co., of Dauphin county; the Strasburg and Landisville companies, of Manchester county; the Womelsdorf and Rehrersburg Rural Telephone & Telephone Co., the Delta Telephone Co., and the Trexlertown Telephone Co.

New Conduit System at Oil City, Pa.

General Manager W. S. Paca, of the Petroleum Telephone Co., of Oil City, Pa., has announced that the extensive conduit system which has been under construction by his company during the past few months has been completed. Although constructed primarily for the purpose of the telephone company, the conduits are large and commodious enough to accommodate all the low tension wires in the city, and it is probable that space in them will be rented to other concerns. The Petroleum Telephone Co. has spent $25,000 on the conduit system, exclusive of the cable. The work of drawing the cable into the conduits will begin within a few weeks.

Merger in Glens Falls District.

Arrangements are under way for the final consolidation of the New York Telephone Company and the Commercial Union Telephone Co. in the Glens Falls district. The territory served comprises Glens Falls, South Glens Falls, Fort Edward and Hudson Falls. The central exchange will be in the new Glens Falls Insurance Company's building and it is expected that it will be in operation about January 1.

Home Company In Joplin Buys Bell Exchange.

The Home Telephone Co., of Joplin, Mo., has bought the assets and business of the Bell company in that city and on April 1 the two plants will be merged and operated as one system by the Home company under the schedule of rates recently authorized by the Missouri Public Service Commission. Manager Adams of the Home company will continue in charge. The division offices of the Bell company will be located in Joplin, as formerly.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Valuation of Bell Property in Memphis.

The city of Memphis, Tenn., is suing the Cumberland Telephone & Telegraph Co. to compel a general reduction of telephone rates. The telephone company insists that the city's demands are confiscatory, and that net earnings upon capital invested does not, under present rental rates, yield more than a reasonable interest rate upon capitalization. To prove its contention the telephone company recently employed 127 men to make a survey of the Memphis plant. The work required 90 days. The details were submitted to an expert in construction engineering, who made an estimate of the value of the plant.

At a recent hearing before Chancellor Francis Fentress in chambers, the attorneys for the city contended for the right of the city to cross examine the 127 employes of the telephone company upon whose field notes an estimate of the total valuation was reached. The court was inclined to hold that the city was wrong in its contention, but delayed decision until certain authorities which attorneys for the city agreed to cite, were produced.

It was estimated, as a result of the work of the 127 employes, that the company had invested in Memphis $1,700,000, exclusive of realty and franchises and deterioration allowance, and that improvements now under way will send the investment up to considerably more than $2,000,000.

The exchange building on Madison avenue will be abandoned and sold as soon as the new station on Court avenue is completed. A switchboard costing $150,000, and still as good as new, but inadequate because of increasing population, will be junked and replaced with a board costing in excess of $200,000.

It was contended by the city that the conclusion of the expert, who is the company's superintendent of construction, was no more competent as evidence than a statement from the president of the company, that its properties were worth so much.

The company, contended, in opposition, that books and accounts of business concerns had been repeatedly and consistently held to be competent to show plant valuation, and that it would present a needless burden and an unsatisfactory and confusing result to cross examine each one of the 127 men who contributed data to the estimate.

Mr. Goodman replied that books were records from day to day, upon which certain conclusions could be based, but that the estimate furnished by the telephone company was not a daily record, but a compilation of figures gotten up, which might be arbitrary, for a designated purpose, and which could not be convincing unless the several witnesses were interrogated as to the means and as to the details of their several reports upon which the final result was based.

Uniform Classification of Accounts for Indiana.

The Public Service Commission of Indiana has sent to electrical utilities throughout the state the final draft of the classification of accounts and forms as prescribed by the commission under the new law. The utilities are divided into three classes. Class A embraces utilities in cities of over 10,000 inhabitants; Class B, those in cities of between 3,000 and 10,000 population; and Class C, those in towns of less than 3,000 population. There are 25 electrical companies in Class A, 53 in Class B and 350 in Class C.

The forms apply to municipal as well as privately owned utilities, and the new system is operative from July 1, 1913. The annual reports of the companies to the commission are to be made in accordance with the forms and specifications prescribed by the commission. The forms now prescribed will provide each utility with a means of securing cost figures, under the provisions of the statute, which requires specification of cost per unit from each company. Classifications cannot be modified or changed in any way without permission from the commission. If, however, a utility desires more detailed information with reference to any department of its business, enlargements of the classification may be made. No attempt was made by the commission to make up all of the small forms, such as work orders and statistical information blanks. The commission announced that to introduce an entirely new set of such forms would be impossible at this early date.

"It is needless to say that all payrolls must be properly distributed as called for in the classification," the commission announced. "Material and supplies of all kinds must be charged to the proper operating or construction account when used. When purchased, these supplies must be charged to their respective storeroom accounts. All invoices or bills for goods purchased by the utility should be checked upon receipt of the goods and the invoices marked so as to leave no doubt as to the proper accounts to which they should be charged."

Maryland Commission Issues Valuation Order.

The Public Service Commission of Maryland has issued its formal order for the valuation of the property of the Chesapeake & Potomac Telephone Co. in Maryland, the company having agreed to co-operate fully with Osborne I. Yellott, assistant general counsel of the commission. The company now has clerks engaged in making inventories of its properties in the state. The order expresses the purpose of the commission to determine whether the rates of the company are just and reasonable and the service adequate.

New York Telephone Co. Explains New Jersey Rates.

The New York Telephone Co. recently sent to the New Jersey Board of Public Utility Commissioners a statement in regard to cancellation by it of a number of contracts for service at flat rates in the cities of Newark, Elizabeth, New Brunswick, Orange, Passaic, Paterson and Plainfield. The statement was filed following the sending to the utility commission of a number of printed circulars, giving what purported to be a comparison of rates charged in the New Jersey cities mentioned, where it was alleged the New York Telephone Co. had a monopoly, and in certain other cities where it was stated competition prevailed. The signers of the circulars stated that they joined with the Postal Telegraph-Cable Co. in protesting against the change in rates by the New York Telephone Co. from a flat rate to a measured service. Some of the statements were signed by local managers of the Postal company. The circulars further contained a charge that the measured service rates were exorbitant as compared with the charges in the cities where competition prevails.

The telephone company, in its statement, says that its action against which these circulars protest was simply an effort to eliminate certain old, obsolete, preferential and discriminatory flat rate business contracts in cities in which measured rates for business service have been the standard rates of the com-

pany for many years, and that such action was in no wise an effort to increase the rates or revenues of this company either directly or indirectly. The company claims that in 1907 and 1908 it adopted measured rates for business service as its standard rates in the above mentioned cities, and since that time has constantly, and as consistently as was practicable in the orderly transaction of its business, endeavored to induce its old subscribers who were enjoying flat rates, to cancel their contracts and substitute therefor contracts on a measured basis.

Such process of elimination was so successful, the company says, that on September 1, 1913, of the total number of 29,370 business stations in the cities mentioned, only 228, or less than one per cent, were under flat rate contracts, all of which have been in force since 1907. On October 25 last, only 26 business stations in these cities were receiving service on a flat rate basis.

So far from expecting an increase in revenue from the elimination of flat rate business contracts in these cities, the company declared, it actually anticipates a decrease of revenue of more than $10,000. The company then declares that since 1910 there has been a total reduction in its annual revenue as already stated, of $603,905, through the voluntary action of the company in reducing its various rates.

Answering the charge of exorbitant rates as compared to cities where competition exists, the company claims that the comparisons made in the circulars are unfair. For example, it declares that the number of stations is nearly 50 per cent. more in Elizabeth than in Trenton, and that the rates used in comparison are nearly 200 per cent. more than the average rate received for measured business service on an individual line. The comparison between New Brunswick, N. J., and Decatur, Ill., shows that the circular compares the maximum measured rate of the New York Telephone Co. for an individual line in New Jersey with flat rate for a two-party line service in Decatur. The company charges that the circular compares an individual line service in Passaic with a four-party flat rate in Johnstown, Pa.

Special Rate to Western Union Upheld.

The State Board of Public Utility Commissioners of New Jersey has handed down a decision dismissing the complaint of the Postal Telegraph-Cable Co. filed against the New York Telephone Co. claiming the defendant company was denying to it certain reductions in tolls on telegrams delivered over the defendant's telephone lines. The reduction in tolls claimed by the Postal company and refused by the telephone company, was alleged to be granted to the Western Union Telegraph Co.

In its memorandum announcing its decision, the utility commission shows that the reduction in telegram toll rates over telephone lines are made under agreements. The memorandum continues:

"The specific demand of the Postal, incorporated in their letter of complaint to this board, asking for reduced tolls on calls designated to deliver telegrams over the telephone, without assumption on the Postal's part of any contractural burdens in the consideration of which reduced tolls are accorded in the contract offered alike to all commercial telegraph companies, would appear to us to involve an undue and unjust discrimination in favor of the Postal, both as against the Western Union and against the public generally. The Western Union obtains the special rates by assuming special obligations. The public assuming no special obligations, pays the regular toll rates. The Postal offering no counter equivalent to justify special rates, asks for what is practically a system of rebates.

Kansas Commission Denies Increase at Ottawa.

The Public Utilities Commission of Kansas has denied an application of the Bell company to increase the rates to patrons in Ottawa. The Bell company agreed to consolidate its system with the Home or Independent system and to erect a plant costing $75,000, but the commission, fearing that the Bell system would not fulfill its agreement refused the application until the plant is erected and in operation. The Ottawa citizens now plan to file complaints against the telephone companies and will endeavor, it is said, to force the companies to erect a modern plant sufficiently large to accommodate the demands, and will then be willing to agree to a small increase in rates.

City-Owned Telephone System Taxable.

Because a municipally-owned telephone company cannot be classed as public property used exclusively for public purposes, the city of Barnesville, Minn., must pay a gross earning tax to the state, according to the opinion of Assistant Attorney-General Stevenson. Since 1903, Barnesville has refused to pay the tax, claiming that the enterprise was public in its nature. More than $1,700 in taxes has accrued from that time. In his opinion, Mr. Stevenson says that city water works and electric light plants can be classed as public property used for public purposes, but that telephone exchanges are of a different nature and not essentially "public" in character.

Chicago Automatic Valued at Half Bell Figures.

In a recent report submitted to the Chicago council committee on gas, oil and electric light, City Electrician Ray Palmer presented the results of an appraisal of the plant of the Illinois Telephone & Telegraph Co. The value of the plant was estimated to be $3,608,030, allowing for depreciation, or about one-half the figures submitted by the two telephone companies, namely $6,236,996, as the basis agreed upon for the transfer of the property. These figures did not include the tunnel, but merely the equipment and the right to use the conduits until they became the property of the city in 1929.

Mr. Palmer's report shows that unless the Chicago Telephone Co. operates the automatic system by itself, the scrap value of the system would not be more than 25 or 35 per cent. of the present physical value. The report points out that the Chicago Telephone Co. can continue the automatic system and gradually incorporate it into the larger system. On this basis the worth of the property to the larger company rises to a higher figure. The reproduction value of the automatic system is said to be placed in the neighborhood of $4,000,000.

Upon receipt of Mr. Palmer's report the council committee requested an opinion from Corporation Counsel Sexton as to whether the proposed merger would be in violation of the Sherman anti-trust act.

It is reported that a plan has been devised whereby a new company will be organized to take over the stock and equipment of the Illinois tunnel company with the purpose of separating the tunnel company from the automatic telephone system and of leasing the latter to the Chicago Telephone Co.

Sees Municipal Ownership for Cities of Northwest.

In a brief filed recently with the Public Service Commission of Washington in the case resulting from the petition of the city of Spokane for lower telephone rates, Corporation Counsel H. M. Stephens says that if telephone rates are not reduced, municipalities will be driven to municipal ownership. It is stated that Spokane, Seattle and Tacoma are keeping an eye on each other's actions, having in mind establishing an independent long distance service in case all the cities should own their own exchanges.

Public Service Commissioners of Washington.

The Public Service Commission of Washington, with headquarters at Olympia, is composed of M. M. Godman, chairman; Arthur A. Lewis and Frank R. Spinning. The

secretary of the commission is J. H. Brown. In a recent item Commissioner Fassett of the city commission of Spokane was mistakenly referred to as a member of the state commission.

Summary of State Commission Hearings and Rulings.

GEORGIA.

December 10: Hearing indefinitely postponed by agreement in case brought on complaint of city of Columbus as to the rates of the Southern Bell Telephone & Telegraph Co.

INDIANA.

December: Petition by George W. Dyke, manager of the Washington, Ind., exchange of the Central Union Telephone Co., for an adjustment of rates on the ground that some farmers are getting service for $1 and some for $1.50.

MARYLAND.

December 2: Order requiring a physical valuation of the Chesapeake & Potomac Telephone Co.'s property in Maryland, in which the telephone company will co-operate.

MICHIGAN.

December 16: Hearing at Bad Axe on petitions from the villages of Kingston, Kinde, Bad Axe, Ubly and Pinnebog for connection between the Valley Home Telephone Co., of Saginaw, and the exchange of John Burns, at Kingston, and with the exchange of the Consolidated Co., at Bad Axe.

MISSOURI.

Date not fixed: Hearing on motion of Southwestern (Bell) Telegraph & Telephone Co. for modification or setting aside of general order No. 4, which order directs telegraph companies to have same listing and service by number as given other subscribers in the same exchange.

December 2: Schedules filed by the Southwestern Telephone & Telegraph Co. for an increase in rates for unlimited direct line business service in St. Louis.

NEW YORK.

November 28: Hearing at Buffalo on complaint of William DeCourcy Rose, a druggist, who charged discrimination on the part of the Federal Telephone & Telegraph Co., for discontinuance of his telephone service because he sold the service to others, when other subscribers were doing likewise. The company declared that the service was discontinued because the sale of service was in violation of his unlimited service contract, and that other subscribers were being treated in the same manner when found doing the same thing.

OHIO.

December 3: Order dismissing complaint and appeal of the Tiffin Consolidated Telephone Co., of Tiffin, Ohio, on that company's motion and consent of the city of Tiffin.

January 6, 1914: Hearing at Cleveland on the complaint of Harrison B. McGraw against the Cleveland and Cuyahoga telephone companies.

OREGON.

December 5: Decision requiring Pacific Telephone & Telegraph Co. and Home Telephone & Telegraph Co., of Portland, Ore., to provide facilities and interchange traffic in the Hotel Oregon.

December 5: Decision declining to order physical connection in the case of the First National Bank, of Albany, Ore., et al, vs. the Pacific Telephone & Telegraph Co., in which connection was sought between the bank's private intercommunicating system and the telephone system of the defendant.

December 5: Decision refusing to order physical connection between the Chehalem Mutual Telephone Co. and the Newberg Telephone Co.

December 5: Decision directing connection to be made between the systems of Henry Chappelle, of Woodburn, Ore., and the United Telephone Co., at Woodburn.

December 5: Dismissal of complaint of Plainview Telephone Co. vs. Pioneer Telephone Co., because the plaintiff's property consists of a number of rural telephone lines that do not come within the definition of a public utility.

SOUTH CAROLINA.

December 17: Postponed hearing on complaint of the Postal Telegraph-Cable Co. that the Southern Bell Telephone Co. is discriminating in favor of the Western Union Telegraph Co.

December 18: Hearing on complaint of Postal Telegraph-Cable Co. that the Southern Bell Telephone Co. is discriminating in favor of the Western Union Telegraph Co. when a call is made by a subscriber for a telegraph company.

SOUTH DAKOTA.

Date not fixed: Hearing on complaint from Highmore as to telephone service in which the Hyde County Telephone Co. is defendant, and an application of Hyde County Telephone Co. for an increase in telephone rental rates. Depositions have been taken and hearing will be fixed as soon as inventory of plant has been filed.

Date not fixed: Hearing on petition of Northwestern Telephone Exchange Co. for increase in telephone rental rates at Sioux Falls, with consolidation of New State Telephone Co. and the Northwestern Telephone Exchange Co. One hearing has been held and final hearing will be held as soon as company has filed inventory and other information required by commission.

WASHINGTON.

December 2: Order requiring physical connection between a privately owned exchange at Tenino and the long distance lines of the Northwestern Long Distance Telephone Co., of Tacoma, and the Pacific Telephone & Telegraph Co.

December 5: Brief filed by Corporation Counsel H. M. Stephens of Spokane, in petition of Spokane for a reduction in the rates of the Pacific Telephone & Telegraph Co.

December 5: Long distance tariffs of Pacific Telephone & Telegraph Co. suspended until this date.

WISCONSIN.

Decision No. U.—223: Finding on rehearing of case of Union Telephone Co. vs. Western Crawford County Farmers' Mutual Telephone Co., People's Telephone Co., and Farmers' Telephone Co. of Lancaster, fixing rates and conditions for the joint use of the systems in question.

Decision No. U.—225: Finding authorizing rate increase applied for by County Line Telephone Co., operating in Tisch Mills, Wis.

Decision No. U.—228: Finding dismissing petition of New Lisbon Mutual Telephone Co. for physical connection with the Mauston Electric Service Co., on the ground that the connection proposed would inure almost exclusively to the benefit of the complainant, and would in some respects be disadvantageous to other companies concerned.

Decision No. U.—235: Finding dismissed for the present the petition of the city of Merrill and the citizens thereof vs. the Wisconsin Telephone Co. in respect to the application of that company for an investigation of its rates in Merrill; held that rates at present are not yielding an unreasonable return.

December 2: The Wisconsin Telephone Co. has avoided hearing on complaint of H. P. Howard against the installation of "nickel first" telephones by allowing complainant to retain "pay after" instrument.

December 2: Hearing held in case of R. B. Wood, et al. vs. Friendship Telephone Co.

December 2: Hearing held on application of the Sharon Farmers' Telephone Co. for a certificate of Public Commerce and necessity.

December 3: Hearing held on petition of the Linzy-Brook Telephone Association for physical connection with the Cecil-Green Valley Telephone Co.

December 16: Hearing on petition of the Western Crawford County Farmers' Mutual Telephone Co. for authority to establish a checking station within the city of Prairie du Chien and for connection of such checking station with all other telephone systems operating in that city.

December 19: Hearing in case of the Belmont & Pleasant View Telephone Co., et al., vs. White Oak Telephone Co. and also same company vs. Wisconsin Telephone Co. with La Fayette County Telephone Co., Intervenor, in the latter case.

December 19: Hearing on application of the La Fayette Telephone Co. for an order fixing uniform service, rates, rules and regulations among telephone companies in La Fayette County, and other relief.

After investigation upon its own motion of the refusal of the Larsen Telephone Co. to extend its service, the Wisconsin Railroad Commission, upon complaint of A. C. Jorgenson, of Larsen, Wis., ordered that the company make the extensions asked for when nine or more persons agree to take the service. When application is made by less than nine, the service may be extended by the deposit of $45, which shall be returned without interest to the subscriber at the end of three years.

December 5: Slight increases in rates were allowed in the application of the Tomahawk Light, Telephone & Improvement Co., of Tomahawk, Wis. The commission permits the company to so amend its rates that the present rates shall apply only within a radius of one mile from the central office, and for distances beyond it may charge 25 cents a month for each quarter mile of line or fraction thereof, the same to be divided between all of the telephones on that line.

VERMONT.

December 2: Hearing resumed at Montpelier in investigation being conducted to determine whether or not telephone rates shall be reduced.

Practical Subjects—Letters and Discussions

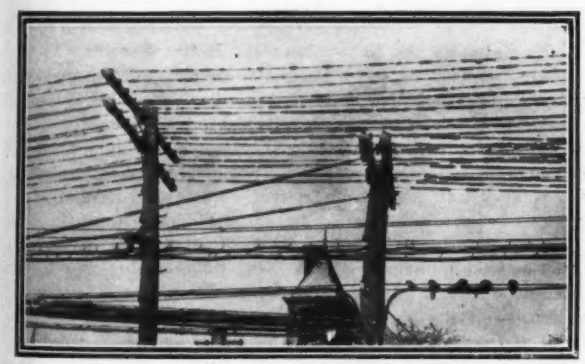
A Suggestion for Reducing Line Maintenance.

One of the largest single items of expense to which the operating telephone company is subjected in many sections of the country, is the item due to the failure of the line construction under stress imposed by sleet. This has been very clearly brought out by recent experiences, notably in Northern Ohio. A letter received recently from E. G. Miller, general manager, of the Warren & Niles Telephone Co., Warren, Ohio, accompanied by two photographs of actual conditions in the Warren exchange area, gives rise to the thought that perhaps a brief consideration of the method of protecting outside construction against damage from sleet might be of value.

In the photographs from Warren, referred to, the wires are in reality No. 10 copper wire, although their diameter, including the ice, is readily seen to be nearly as great as 100-pair cable. This timely contribution by Mr. Miller illustrates very pointedly one of the principle considerations in designing protective means against damage by sleet.

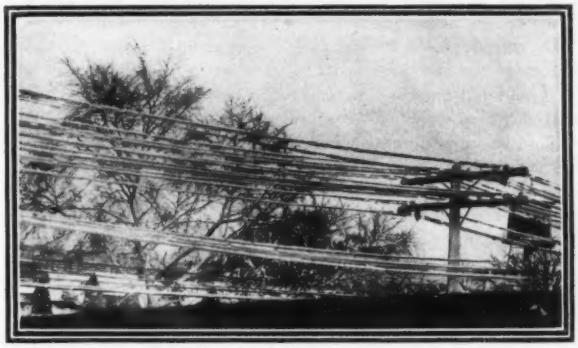
In the first place, a pole lead carrying one or two messengers supporting aerial cable, is very seldom damaged by the same sleet storm which absolutely demolishes open wire leads carrying a great many less subscriber circuits than the cable leads which withstand the destructive forces of the storm. Hence as a practically certain protection against sleet, put the lines in cable. While the remedy is simple, the expense is so high in some cases and so certain, that, compared with the indefinite, uncertain recurrence of sleet storm damage, it appears sometimes to make the remedy worse than the disease; therefore, partial measures may be considered. While it should always be borne in mind that aerial cable, properly installed, is an almost absolute insurance against damage by sleet storms, the proper installation of guys and the careful supervision of leads to confine their load within a reasonable capacity, will go far to reduce the annual expense chargeable to this class of maintenance.

A brief consideration of the sequence of events which occur when a pole lead fails, due to sleet, will indicate without further outline, the methods which the careful superintendent of construction will adopt in tuning up his plant for future emergencies. The actual weight of the ice as it freezes on the line wires, does very little damage. It is true that one or two lines perhaps will be found open in each section, but no poles are broken, no cross arms destroyed and no entire groups of subscribers are deprived of service. The damage



The Real Test of Line Construction.

wrought by a sleet storm would be negligible, or at least not serious, if the sleet storm were not always accompanied by wind of greater or less velocity. As the ice accumulates on the wires, each wire offers a greater surface to the wind than normal and the longer the wire or pole lead remains uninjured during the storm, the greater this surface becomes. With a wind blowing at a rate which would have no effect on the lead in ordinary weather, the increased surface presented to the wind by the ice on the wire, causes the wire—in saying wire it should be remembered that each and every wire on the



Lines of Ohio Company After Sleet Storm.

pole lead is meant—to be deflected and thrown into swinging vibration whose greatest amplitude is necessarily at an angle with the principal axis of the span in which the wire is found. The swinging vibration of the greatly weighted wires induces a vibration of similar amplitude in the poles, but the vibration of the poles is not in phase with the vibration of the wires, reaching its maximum deflection from normal, probably, when the wires are occupying a position most closely approximating their normal position.

Assuming that a cubic foot of ice weighs 60 pounds, it does not require a very extended or accurate calculation to emphasize the tremendous strain that is placed upon the pins, cross arms, and poles when the wires, heavily loaded with ice, are thrown into vibration by the wind. As soon as the total pull required to arrest the swing of the loaded wires exceeds the mechanical resistance opposed by the strength of the weakest pole, the pole fails, thereby suddenly and tremendously increasing the strain on the two adjacent poles, and the whole lead goes down, until the failure reaches a point where there is a stronger pole of one securely side-guyed. Hence the point to bear in mind when building pole leads to carry open wire in any considerable amount in a territory subjected to the class of atmospheric conditions which would cause sleet storms, should be to carefully and thoroughly install reliable and efficient side-guys to minimize any possible deflection of the poles at an angle to the axis of the lead; and to consider when the load of wires begins to assume proportions greater than were estimated to be the requirements when the lead was designed, whether it would not be better to install an aerial cable on the poles in preference to adding more open wires with the possibility of having to rebuild the entire lead after the next sleet storm.

In closing, it may be worthy to note that the leads shown in the photographs sent in by Mr. Miller, did not fail under the severe conditions shown.

Harmony With Subscribers.

You should be in harmony with your subscribers. Why? Are you working for the interest of your company? Are you working for your own interest? Are you working for the interest of your subscribers? If you are you will keep in harmony with your subscribers. As manager of a village exchange, I will say I do not think that I have a subscriber but who would do me any reasonable favor that I might ask.

In the past few months I have saved the company a great many dollars in such ways as the following: If I get a report that a telephone needs batteries, and this instrument may be several miles out in the country, I call the subscriber and ask him if he can put in a pair of batteries for me. The answer is generally "yes." Then I explain that it will help both him and the company, as his telephone will be repaired in less time, as I do not generally think it necessary to make the drive for a pair of batteries. Parcel post and R. F. D. are other things necessary for the working of this plan.

By this method, the company saves from 75 cents to $1.50; the subscriber is more satisfied than as if he had to wait until I had more reason to make the drive. It may save me a half day's work when I am very busy.

This is only one case where everyone concerned will be better satisfied and where I find that being in harmony with subscribers assists in numberless ways. Above all things, always remember to appreciate such things. You cannot get any one to do anything for you, unless you show them you deserve it.

Ohio. O. J. W.

Mud-Proof Sets Are Needed.

The accompanying photograph shows one of the many reasons why telephones do not work well at times. The picture shows one of two sets used by Company E, 54th Regiment, Iowa National Guard, on the rifle range and brought to us for repairs. Upon inspection, we found them to be literally full of mud, wasps' nests and plastered up until none of the moving parts could work. On removing the mud, etc., from

Telephone Set That Furnished Home for Wasps.

the instruments and weighing it, we found that there was three pounds, ten ounces of it. These sets are of a small type, the dimensions being about 4 ins. by 6 ins. by 7 ins.

Centerville, Iowa. C. A. Farrington.

City Engineer's Tests Caused Cable Trouble.

We had an interesting case of cable trouble recently and think it would interest TELEPHONY'S readers. Ten or 15 lines came in permanent, and on test all showed dead ground.

It was a dry day and we had no high resistance leaks, and it didn't sound like water. We thought laborers must have dug into the underground cable, as most of these pairs only worked through underground.

Sending a man over the route of the underground, no one was found digging. Next with the help of a Matthew's Telefault, we located the trouble between two manholes.

The plant chief said to the boys: "There has been something doing. Guess I'll play detective for a few minutes."

He then walked over the top of the conduit between the manholes to look for mysterious footprints. About 100 feet from one manhole in front of a restaurant he found a paving brick that, it seemed to him, had been taken out and put back again. It showed fresh hammer marks.

Going to the restaurant he asked the cashier, whose position is near the window, if she had seen any men at work in front of the place. She answered that she had seen no one. One of the waiters who overheard the question stepped up and said he had seen two men driving a rod down there. By further inquiry, we found that the city engineer had been sounding for sand rock.

Knowing the point where the brick had been removed to be over the cable, the plant chief had men dig down and they found that the rod had been driven into the cable.

The cable and conduit were repaired and the lines were only out three hours in all.

Illinois. S. C.

New Fire Information Rule in New England.

Telephone operators at Brunswick, Me., have been required to enforce a new rule of the New England Telephone & Telegraph Co., to give only the box number of the fire alarm when asked as to the location of fires. In explaining the new rule, Manager Austin said, in part:

Generally this is what happens when the fire whistle blows: A large number rush to the telephone and try to get the central office. The switchboard in a few seconds becomes one solid mass of signal lights, and if the call comes late at night when there are only one or two operators on duty, they cannot possibly answer more than a small fractional part of the calls.

Bear in mind that the fire whistle has hardly stopped blowing, that the operator has not had time to ascertain the location of the fire and you will see the senselessness of trying to answer the question "Where is the fire?" not to speak of the impossibility of giving adequate answers to those who are seeking for the particulars.

Other subscribers also have need to use the telephone, and it is not an uncommon thing for their calls to be delayed several minutes, simply because the operator cannot distinguish one signal from another on the switchboard and answers them in rotation just as fast as she can. The call might be for another fire, for police, doctor or some other important matter.

Of course if any subscriber has business, or personal interests that may be affected by the fire, we shall be glad to give him the address of subscriber's living in the vicinity of the fire alarm box from which the call is sounded, and whom he may call if he so desires.

Enlisting the Subscribers for Better Service.

"Better Telephone Service" is the subject of a four-page folder, which the Chesapeake & Potomac Telephone Co. sent out last month to each one of its subscribers with the telephone bills, which are mailed on the first of month. The pamphlet is an appeal to those using the telephone to help the company attain better service, and instructions and suggestions are given which may help in attaining that end.

"Everyone wants telephone calls handled with the maximum speed and the minimum of error," the folder recites. "It takes three persons to complete a telephone call—you, the telephone operator and the person you are calling. We can give you speed and accuracy if our operators have your co-operation in the few simple ways outlined in these suggestions.

"Do not rely on your memory in asking for a number. Speak directly into the receiver. Listen to the operator's repetition of the number. Be courteous to the operator and to the person to whom you are speaking."

Other instructions, which will be of much help, are also given, and the company's officials admonish everyone to abide by the suggestions.

Interchange of Service Ordered in Oregon Hotel Case

Railroad Commission of Oregon Decides that the Pacific (Bell) Telephone & Telegraph Co., and the Home Telephone & Telegraph Co., of Portland, Must Provide Interchange of Service in Hotel Oregon, Portland—Other Physical Connection Decisions in the Same State

The Railroad Commission of Oregon has ruled that the Pacific Telephone & Telegraph Co. and the Home Telephone & Telegraph Co., of Portland, Ore., must maintain facilities and make all necessary regulations for the interchange of business and traffic carried between them at the Hotel Oregon, in Portland. The order was issued on December 5, full hearings having previously been held.

The case is that instituted by the Wright-Dickinson Hotel Co., Charles Wright, and M. C. Dickinson and has attracted a good deal of attention because of the physical connection principle at issue. The Pacific Telephone & Telegraph Co., or Bell company, operates a telephone system in Portland and has long distance toll line connections with its exchanges in other cities. The Home Telephone & Telegraph Co. operates a telephone system in Portland and has toll connections in Washington and Oregon, by connection with the Northwestern Long Distance Telephone Co.

Decision of the Commission.

In its decision the commission says:

There is active competition between the Home and Pacific companies for telephone business in the city of Portland, and between the Pacific and Northwestern companies for toll long distance telephone business in Oregon and Washington. At the time of the hearing, there were 39,910 stations connected with and forming part of the Portland plant and exchange of the Pacific company, and 13,582 with the Portland plant and exchange of the Home company; approximately 8,000 telephone stations are duplicates, so within the exchange limits of the Pacific company, in Portland, there are approximately 32,000 telephone stations which can be reached only over the Pacific company's lines.

The Hotel Oregon, operated by the Wright-Dickinson Hotel Co., contains approximately 400 rooms, with the appointments customary in carrying on a hotel business of that size for the entertainment and accommodation of the public. For the proper accommodation of the guests of the hotel and of the citizens of the city of Portland and elsewhere, including the patrons of both the Pacific and Home companies' systems, it is both convenient and necessary that there be telephone communication between the Hotel Oregon and the exchanges of both Home and Pacific companies, whereby stations both local and long distance may be reached.

The Home company and hotel company have installed in Hotel Oregon a private branch exchange telephone system, which is intercommunicating between each of the rooms and the various departments of the hotel, and by means of which connection may also be made with the telephones of the various subscribers of the Home company and with the long distance lines of the Northwestern company. Connected with such private exchange in the hotel are 426 telephone stations. The system comprises a switchboard with which the trunk lines of the Home company are connected, wire circuits to each telephone station, a transmitter and receiver at each station, and suitable signaling devices. The equipment (except the wiring inside the hotel) is the standard equipment of the Home company, owned and maintained by it. The wiring inside the hotel is the property of the owner of the building, or the Wright-Dickinson Co., and the operation of the switchboard is carried on by operators employed by the hotel company.

The Pacific company has also installed a private branch exchange in the Hotel Oregon, with 45 stations connected therewith, located in the office, halls, dining rooms and in other public places in the hotel. This exchange is also intercommunicating and affords connection with the telephones of the various subscribers of the Pacific company in the city of Portland, and with its long distance lines and other companies' lines connected therewith. The equipment is the Pacific company's standard equipment, owned and maintained by it, and (except for the automatic signaling device of the Home company's instruments) is generally similar to that of the Home company. The switchboard with which the trunks of the Pacific company are connected, is immediately contiguous to that of the Home company, and both are operated by employes of the hotel company.

The only manner in which guests of Hotel Oregon can now reach or be reached by subscribers over the Pacific company's lines into the hotel is by means of one of the stations located in the lobby, hallways or other public or semi-public places in the hotel, which is inconvenient and unsatisfactory both to the calling and the called person, and is an inadequate arrangement, and, in the case of incoming calls, often results in considerable delay in service while the party called is being summoned. The only arrangement which the Pacific company is willing to permit whereby efficient service can be maintained between the rooms of the Hotel and the system is to extend such system so there will be a telephone in each room.

This proposal involves an expense of about $3,000 for additional wiring in the hotel, which under the Pacific company's rules, it proposes shall be borne, approximately $1,800 by the Pacific company, and $1,200 by the hotel company; and also involves the construction of approximately 14 additional trunk lines from the central office of the Pacific company to the hotel, and the installation and subsequent maintenance of a new and enlarged switchboard in the hotel and the use of approximately 381 additional telephone station sets, consisting of transmitter, receiver and signaling device, at a large expense, borne by the Pacific company. The use of such duplicate telephone system would be confusing and unsatisfactory. The existing service of the Pacific company in the premises, and that proposed as an alternative, are each hereby found to be inadequate.

It is entirely feasible from mechanical technical standpoints to connect the two switchboards of the Pacific and Home companies in Hotel Oregon at a nominal expense so that telephonic traffic can be interchanged between the Pacific company's system and the various telephones of the Home company's system located in such hotel, without impairing the efficiency of service of either the Pacific company or Home company, or any part thereof, and without the necessity for additional investment by any of the parties to this proceeding, and without involving a duplication of equipment and facilities and without in any way interfering with the competition between such companies.

Home Company Favors Connection.

The defendant Home company by its answer avers that it is ready, willing and able to enter into such an agreement. Such interchange of traffic was carried on in the Hotel Oregon for a very short time and was then discontinued by the Pacific company; and at the time of the hearing a similar arrangement was effective in another hotel in the city of Portland, but such latter arrangement was without the

knowledge of the Pacific company. The ability to reach both systems by means of one station set is a matter of great convenience and of economy to the public generally and to the plaintiffs and their patrons in particular.

An adequate service and reasonable facilities to be afforded by the Pacific company and Home company for the interchange of business and traffic carried of such companies, in the premises, are the following: To connect their switchboards in the Hotel Oregon in such a manner that calls coming in over the Pacific company's trunk lines to its switchboard may, at the option of the hotel company, be transferred, by proper wire circuits, to the switchboard of the Home company for the purpose of being then connected with the station instruments of the Home company in the rooms and other places in the hotel; and conversely, that in the hotel may, at the option of the hotel company, be transferred to the switchboard of the Pacific company, and thence switched outward over its trunk lines and their connections operated by the Pacific company, and, after such switchboards are so connected, thereafter to interchange such business and traffic by means of such facilities, without discrimination, to the same extent as if the same were entirely over Pacific company's lines and equipment, Thirty days from the date of the service of a copy of this order upon the Pacific company and the Home company is a reasonable time within which to provide such facilities and interchange such traffic.

The expense of such connection should be borne by the plaintiff hotel company. The expense of maintenance of the connection should reasonably be borne equally by the Pacific and Home companies.

A reasonable compensation to be paid to the Pacific company by the hotel company and a reasonable toll and charge to be made by the Pacific company for the service performed by it in making such connections, is the following: The sum of three and one-third cents for each call going out from such hotel and transferred from the switchboard of the Home company to that of the Pacific company, in addition to the sums now reserved by the existing contract between the Pacific and Hotel companies for private branch exchange service. The payment by the hotel company in advance, or securing to the defendant Pacific company to its reasonable satisfaction, of the estimated amount of such charges, will be, if demanded by the Pacific company, a condition precedent to its furnishing such service.

It is, therefore, ordered, considered and determined that the defendants shall, within 30 days from the date of the service of a copy of this order upon them afford the service hereinbefore found to be reasonable and the facilities found to be reasonable, and make all necessary regulations for the interchange of business and traffic carried between them at the Hotel Oregon in the city of Portland, and thereafter operate and maintain the same for the interchange of such business and traffic, in the manner, and for the compensation, hereinbefore found to be reasonable and adequate.

It is further ordered, as a condition to this order, that the plaintiffs shall agree to keep an accurate record of the calls switched from the Home company's switchboard to the Pacific company's board, and submit the same monthly to the Pacific company, and, if requested, to the commission.

It is further ordered, that jurisdiction hereof be retained for the purpose of adjustment of the compensation to be paid by the hotel company to the Pacific company, upon motion of said defendant or the plaintiffs and upon ten days notice by the commission to all parties herein of time and place of hearing hereof.

Other Physical Connection Decisions.

Four other physical connection cases were decided by the commission the same day, and in each of these there were points of differentiation.

In the case of the First National Bank, of Albany, Ore., et al, against the Pacific Telephone & Telegraph Co., the bank sought to secure connection of its private intercommunicating system with the defendant company. The commission declined to order this connection, finding that as the bank is not a public utility, it is not within the purview of the law.

In the case of Henry Chappelle, owner of a telephone exchange in the city of Woodburn, Ore., against the United Telephone Co., which operates exchanges at Hubbard and Woodburn, the commission found that public convenience would be served by interchange of business between the plaintiff's exchange and the defendant's exchange at Hubbard, and directed such connection to be made, each company to pay the other five cents on each call originating on its line and carried over the other's lines.

Finding that the territory served by the Chehalem Mutual Telephone Co. and the Newberg Telephone Co. is substantially the same, and that active competition exists between them, the commission refused to order a connection on the complaint of the company first named, holding that no public necessity exists for such interchange. This is without prejudice to future complaints if the Newberg company fails to adequately supply the territory.

Dismissal of the complaint was ordered in the case of the Plainview Telephone against the Pioneer Mutual Co., the commission finding that the plaintiff's property consists of a number of rural telephone lines that do not come within the definition of a public utility.

Physical Connection Order in Ontario.

The Ontario (Can.) Railway & Municipal Board, after a hearing at Brockville, has issued an order requiring the Mallorytown Independent Telephone Co., of Mallorytown, Brockville county, Ont., Can., to link its lines immediately with those of the Plum Hollow & Eloida Co., of Leeds county. The Mallorytown company gave as the reason for holding off, that it was afraid of losing connection with the Bell company by making the connection. These are the last two lines in the counties waiting to be linked up. When the arrangement is made there will be connection between a total of 13 rural companies in Leeds and Grenville counties.

Municipal Ownership Proposal for Portland, Ore.

The Public Ownership League of Portland, Ore., recently came forward with a proposal that the city have a municipally owned and operated telephone system and that it raise $3,000,000 to pay for it by issuing municipal telephone certificates. It is proposed that these certificates bear 5 per cent. interest or less, be sold at not less than par and be secured by mortgage on the telephone system rather than become a general liability on the municipality. It is planned that they be paid, principal and interest, out of telephone revenues. It is stated that this telephone proposal is to come before the public for decision at the city election in June, 1915.

Physical Connection Order in Washington.

The Public Service Commission of Washington has issued an order, following a recent hearing, requiring physical connection between a privately owned exchange at Tenino and the long distance lines of the Northwestern Long Distance Telephone Co., of Tacoma, Wash., and the Pacific Telephone & Telegraph Co.

Ohio Supreme Court Refuses Injunction.

The Ohio Supreme Court has ruled that the Brownville Farmers' Telephone Co. may proceed with the construction of its line in Licking county. The lower courts were sustained in refusing an injunction sought by the Gratiot & Brownville Telephone Co. to prevent the new concern from building its line.

Queries on Theory and Practice

Mileage Measurements on Farmer Lines.

We have a No. 14 iron metallic line about eight miles long with seven 2,500-ohm bells bridged to ground for selective ringing. The line runs through about 2,000 ft. of No. 22 gage paper insulated, lead covered cable. This line came in short and upon measuring, I got 29 volts on a direct reading and 8 volts on a shunt reading, using a 30-volt Weston voltmeter having a resistance of 20,000 ohms and a 200-ohm shunt. I should like to know the formula for getting the mileage on a short and on a ground when there are grounded bells on the line; also when using the 200-ohm shunt.

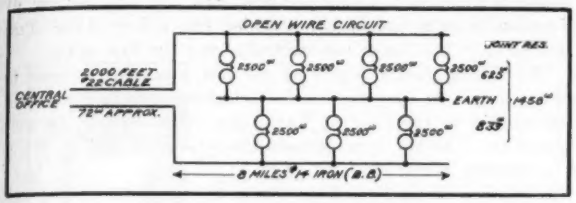


Fig. 1. Condition of Line.

It is rather difficult to measure for faults on lines which have bells without condensers, bridged so as to form leaks either from line to earth or across the line. Even if there are no bells to bother, you can not locate a short circuit accurately, because the short circuit itself may possess appreciable resistance. In this case, you can say with safety that the short is not beyond a certain point, but may be anywhere between that point and the office. For instance, if a circuit has 114 ohms resistance per mile of circuit and measures up a short circuit of 570 ohms, it may be caused by a dead short 5 miles out, or a 456-ohm short circuit, 4 miles out, or a 342-ohm leak across the pair, 3 miles out, or even a 570-ohm short circuit in the office. But it could not be beyond the 5-mile point, unless there is an error in the measurement or calculation.

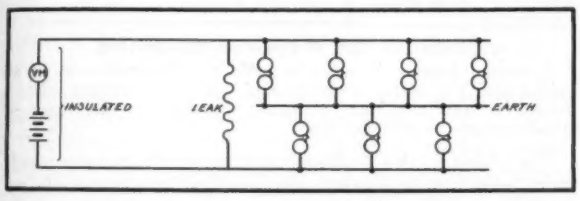


Fig. 2. Testing Battery and Voltmeter Insulated.

In your case, the fact that the bells are bridged from each side of the line to earth, makes their joint resistance (metallic) greater and so makes less the error of neglecting them. The conditions are shown in Fig. 1. The 2,000 feet of No. 22 B. & S. gage cable pair will have a resistance of approximately 72 ohms. The No. 14 iron wire will be assumed to be the BB grade and of 114 ohms resistance per circuit mile, so that the eight miles will total 912 ohms resistance. If you had a dead short at the far end, it would measure up, cable and all, 912+72=984 ohms.

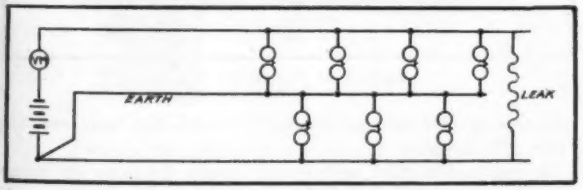


Fig. 3. Testing Battery Grounded.

The resistance may be calculated from the voltmeter readings, as follows: $X = R\left(\frac{E-e}{e}\right)$

in which X = resistance to be measured, R = resistance of measuring instrument, E = voltage of battery, and e = indication given with the unknown resistance in series.

You did not give the battery voltage, so it is assumed as 30 volts. Your reading without the shunt is not reliable, since it differs so little (only one volt) from the battery voltage. Taking the results of the test with the 200-ohm shunt, $R = 200$ ohms, $E = 30$ volts, $e = 8$ volts,

$$X = 200\left(\frac{30-8}{8}\right) = 200 \times \frac{22}{8} = 200 \times 2.75 = 550 \text{ ohms.}$$

In case the line is made up of sections which differ as to resistance per mile, each section must be considered separately. Thus, the cable part of your line totals 72 ohms. If the measured resistance were less than 72 ohms, your trouble would be in the cable, but since it is greater, the leak *may* be beyond, though not necessarily so.

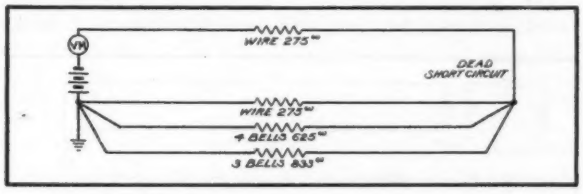


Fig. 4. Simplified Condition Showing Error in Measurement.

Neglecting the bells, you have 550—72=478 ohms beyond the end of the cable to the short. If your No. 14 iron wire is BB, it will have about 114 ohms resistance per mile of circuit. Dividing the 478 ohms by 114, 4.2 miles is obtained as the distance to the short beyond the end of the cable. It could hardly be farther out than this, and could be nearer.

The manner in which the voltmeter and battery are connected have a great deal to do with the results obtained. The best practice is to have both battery and voltmeter insulated from earth when measuring across the line, as in Fig. 2. This is the condition assumed in calculating the above results. The fact that the bells touch earth between the lines does not affect the measurement; you have only to account for their resistance as a bridge. Since we do not have their spacing along the line, we can not correct for them.

Often the testing battery is grounded as shown in Fig. 3. Now suppose the leak to be a dead short circuit. This will bring the lower wire and both sets of bells in parallel with each other, as shown schematically in Fig. 4. Suppose that it is really 275 ohms in each line wire to the short. On account of the bells being in parallel with the wire, it will reduce the resistance to 159 ohms. The measured resistance will be 275+159=434 ohms. This is 116 ohms too low, and will make a mile error in the location.

Reversal of Telegraphic Signals in Telephoning.

I have the occasion to transmit messages over telephone lines, aggregating about 34 miles, by placing the telephone transmitter against the telegraph instrument sounder and the message is taken by an operator through a telephone receiver. We are repeatedly confronted with the fact that the characters as made, are reversed at the other end of the line, making it next to impossible for the receiver of the message to

transcribe it correctly. To state further details, will add that at the beginning of the message it may be going through all right and suddenly reverse as stated. Is there any known reason for this and can it be avoided?

We do not know what caused the reversal of the telegraphic signals, when transmitted over the telephone as you describe. Even when the transmitter of the telephone is in contact with the sounder, it transmits the sound produced by the sounder.

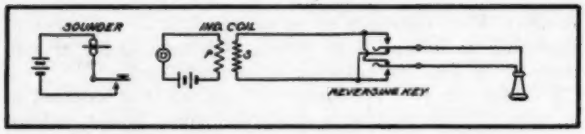


Fig. 1. Transmitting Telegraph Signals by Telephone.

This sound will be correctly interpreted by the receiver, no matter which way the latter is connected to the line. This was tried out as shown in Fig. 1, by inserting a reversing key in the receiver circuit. The distinctive characters of the down and the up strokes of the sounder were easily distinguished, regardless of the position of the reversing key.

The circuits of Fig. 2, *A, B,* and *C,* failed to produce reversal of signals, but they were more difficult to read, as the

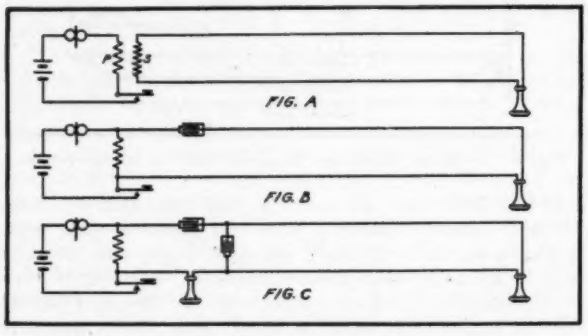


Fig. 2. Various Circuits Used in Experimenting.

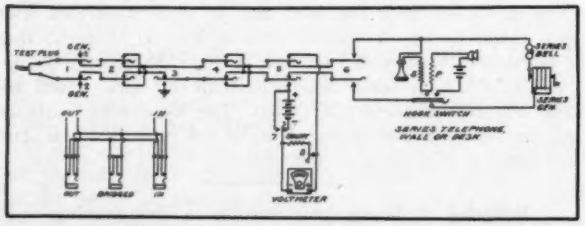
firm, snug down stroke and the slight, vibratory ringing sound of the up stroke were not present.

There may be some chance of further developments by placing the telephone transmitter in different relations to the sounder, but you are in a better position to try this than we.

We will appreciate any further light which you may be able to discover on this interesting phenomenon, which we would have declared impossible.

Circuit for Wire Chief's Desk in Small Exchange.

I should like you to send me a wire chief's circuit for a small exchange of 500 subscribers. We have all grounded lines except one copper metallic toll circuit. The circuits



Wire Chief's Test Circuit for Small Magneto Exchange.

will probably be changed from grounded to metallic next year.

The requirements for a small magneto exchange wire chief's testing equipment are met very satisfactorily by the arrangement shown in the sketch. It is assumed that suitable protective devices are provided on the main distributing frame, so that a testing shoe can be inserted for cutting apart the line. This will give the wire chief the power to test lines out toward the substation, as well as in toward the switchboard.

The lines from the testing shoe on the main distributing frame should be run to two jacks on the wire chief's desk. They are shown in the diagram as "Out" and "In." Between them is a simple bridged jack for the purpose of listening in on a line, before plugging into either of the other two jacks. The latter automatically cuts the line apart.

The testing circuit begins at the test plug, and extends to two points. At Key 6, a series telephone may be connected for ringing or talking. At Key 5 the voltmeter may be connected in. The key combinations are as follows:

Insulation across the pair, Key 5;

Insulation of tip line, Keys 5 and 3;

Insulation of sleeve line, Keys 5, 3, and 2;

Foreign voltage, throw Key 7, and then make any insulation combination;

To reverse voltmeter polarity for any test, Key 4;

To apply shunt to voltmeter for low resistance measurement, Key 8;

Ordinary ringing, Key 1;

Tests of all kinds on grounded lines, use Key 3.

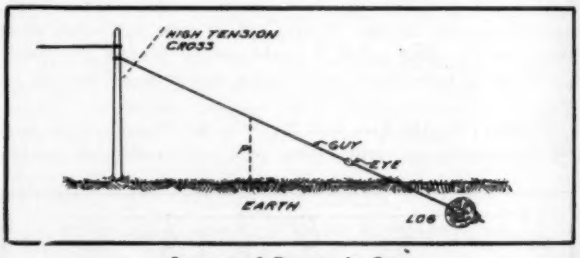
Many tests for grounds can be made by ringing with the series generator and bell, using it as a voltmeter, as is well known to maintainers of magneto plants.

Insulating Guy Wires from the Ground.

A new ordinance in our city calls for the insulation of all cables and guy wires from ground. Kindly give me any information you may have at hand, showing the advantage or disadvantage of this method.

The object of this ordinance is undoubtedly to keep people from being hurt by touching guy wires which may become accidentally crossed with high voltage circuits. There may be enough resistance in the earth connection through an anchor, to shunt considerable current through the body of a person who, standing on the ground, may touch the guy wire, as indicated in the illustration.

This resistance may be in a rusted contact at the eye of the anchor rod, or at the surface of the rod where it touches the soil. In either case, a person standing at *P* and touching the



Sources of Danger in Guys.

guy will receive part of the current. Injuries have resulted from this cause.

A thoroughly tried and proven strain insulator or circuit breaker should be used in the guy at a point high above the ground to be beyond the reach of the public and low enough to be below the lowest power wire. Your ordinance very likely provides for these distances.

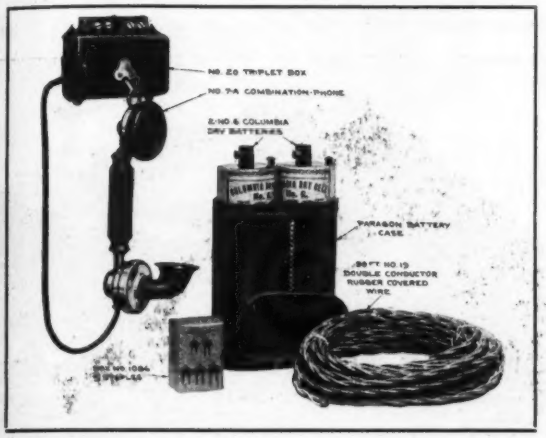
The advantage of insulation is a slight increase in safety to the public. Though injury has resulted as above described, we do not consider the risk very great. As far as we know, the only disadvantage is the expense and trouble of installing and maintaining the strain insulators.

From Factory and Salesroom

Conventions: Independent Telephone Association of America, Chicago, January 6, 7, 8; National Independent Telephone Association, Chicago, January, 13, 14, 15

Combination Telephone Extensions for Farmers.

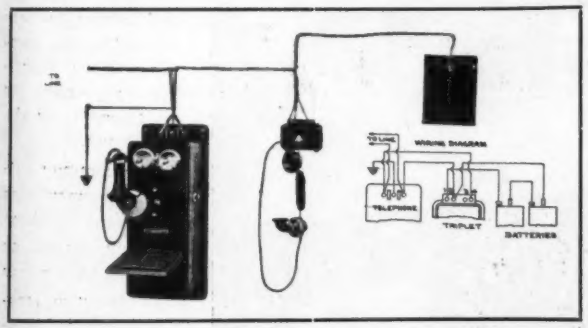
The added comfort and convenience of a combination telephone extension is clearly shown in an attractive folder which the Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., is sending to its rural friends. This circular brings out in an interesting way, the usefulness as well as the convenience of this outfit.



Combination Extension Telephone and Installation Material.

The folder is printed in many colors and contains illustrations showing the adaptability of the combination telephone for this kind of service. One view shows a man is lying in bed sick. Without any effort, he can reach for the combination telephone extension which has been installed at the head of his bed to call the doctor. Another illustration shows the doctor at the other end of the line, answering the call.

The folder shows diagrams and gives instructions which will enable the farmer to connect the outfit to his regular party line telephone without any difficulty. The complete outfit as pictured in the folder, contains the combination telephone, with triplet box attached, two dry cells in a Paragon case, together with all necessary wire, and insulated staples.



Wiring for Combination Extension Telephone.

This advertising should be of special interest to the telephone companies who, in a great many instances, are the only ones benefited by it. This folder is intended to create a demand for extension telephone service. In localities where farmers do not own their own telephones the extension cannot be purchased from the manufacturers, but must be rented from the operating companies.

Exchange managers are advised to follow up the interest created in this class of service and to do a little local advertising themselves. The Stromberg-Carlson people have a number of very attractive pamphlets advertising extension telephones, which they imprint and furnish, free of charge, to companies that ask for them. This affords a good chance to do a little free advertising to promote the interests of the telephone company and increase the rental revenue.

"Something New Under the Sun."

It is well known that subscribers on the country telephone lines are greatly inclined to "rubber." The country lines are the most convenient means of exchanging news and gossip and everyone is interested. Grandma sits by the telephone so that she can tell the men folks, when they come in from work, all the latest news of the neighborhood. Evesdropping is expected of everyone in the country, so that what would be an intrusion in the city is considered a custom in the country. Condensers are furnished with the telephones so that receivers that are off the hooks will not interfere with the ringing.

Every telephone man knows also that every time the receiver is taken off the hook, the batteries begin to work. It is not an unusual thing to be obliged to renew batteries every three or four months and this often means a long cold drive, an expensive trip and the cost of the batteries. For some time before the renewal also, the telephones talk poorly and this is a cause of the tendency to enter complaints.

The Ericsson Mfg. Co., of Buffalo, has brought out a new telephone for use on rural lines, which enables a subscriber to listen all day, if he or she wishes, without using any battery. When he wishes to talk, it is necessary only to press the switch in the handle of the handmicro.

In designing and bringing out this telephone, Ericsson has taken into consideration, not only the comfort and convenience of the subscriber, but also the needs and economy of the telephone company. With the company's "Farmer Line Special" telephone, it is very easy to sit at ease in a rocking chair and get all the news and gossip.

With a condenser in series with the receiver, there is no difficulty in ringing, even if every receiver on the line is down. With no transmitters on the line, there is no outside noise to interfere with subscribers who are carrying on a conversation. The dogs can bark, the children can cry, the phonographs can play, and the talking subscribers hear nothing of it.

Such a telephone is an interesting solution of a difficulty with which farmers' lines have to deal and the Ericsson company demonstrates its ingenuity in providing this device. Further information may be had by writing to the Ericsson Mfg. Co., Buffalo, N. Y.

A 10,000-Line Switchboard at Hamilton, Ont.

A new 10,000-line switchboard was cut in at the Hamilton, Ont., Can., exchange of the Bell Telephone Co. of Canada, this week. The building in which the exchange is located is a new one, on the site of the first Hamilton exchange of the Bell.

Development of an Iowa Independent Telephone Company

History of the Story County Independent Telephone Co., of Nevada, Iowa, Dates from 1899 When Mutual Company was Organized—Its Growth and Successive Changes in Equipment—Description of New Building and Service Now Rendered

By G. S. Peck, Jr.

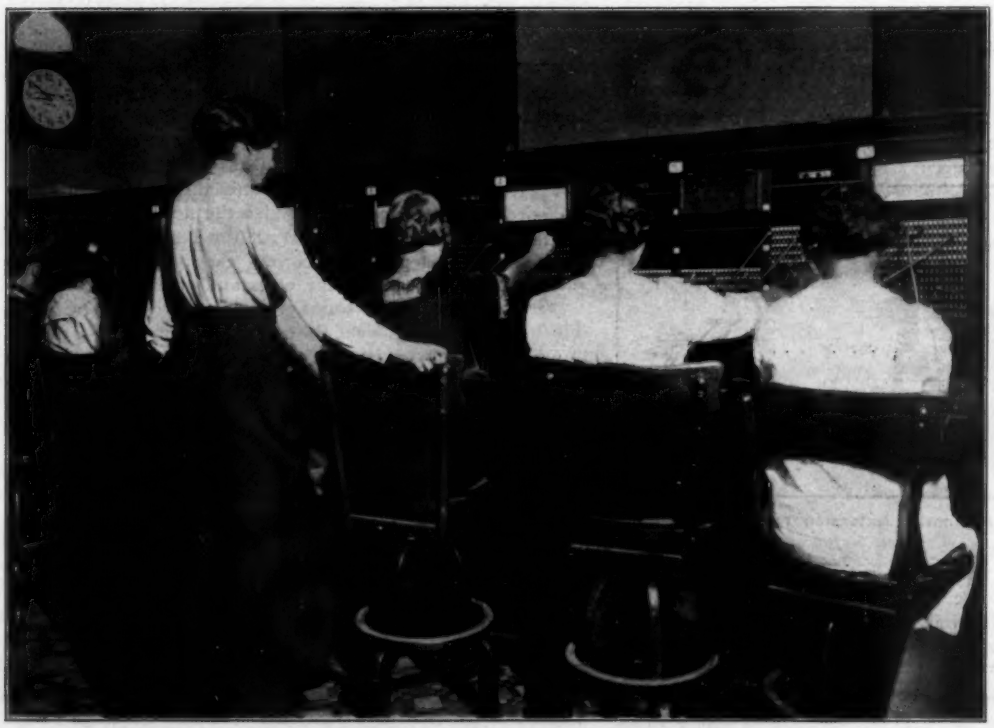
An example of present day success, brought about through the evolution of an earnest corporation, always looking to future betterment, is the Story County Independent Telephone Co., of Nevada, Ia., the live officials of which question the right of the world to "wag on," unless they be permitted to do a little wagging on their own account. The president, M. C. Allen, the treasurer, D. R. Spieker and the secretary and manager, F. M. Boardman, with conscientious and far-sighted judgment, have individually and collectively worked for the perfection of their plant and the success of their company, until today they can not only point to it with pardonable pride, but, enjoy the thought that each subscriber is a friend and well-wisher, satisfied with the service rendered.

The year 1899 saw the organization of the original company, which did business under the name of the Nevada Mutual Telephone Co. until the year 1908, when three other exchanges were bought and consolidated as the Story County Independent Telephone Co. But, as early as 1903, the original switchboard, long since looked upon only in the light of a necessary evil, was supplanted by one of Kellogg manufacture. It only needed this entering wedge to proclaim the handwriting on the wall, and as the years rolled by, with attendant increase of business, larger cabinets were installed, equipped for double supervision, while the equipment of the old cabinets was transferred to the new.

With some few minor changes, this apparatus served most satisfactorily; but, on the first of the present year, when a meeting of company officials was called to discuss the ever-present thought—betterment of service—it was unanimously decided that the common battery multiple switchboard only, could work to that end. And so, in a sense working along the lines of least resistance, with the idea of catering to the desires or needs of the subscribers, and making rates according to service quality, rather than arbitrarily raising all rates at once, a decision was reached in favor of the purchase of a Kellogg standard universal board.

New Building of the Story County Telephone Co.

While this board was in course of construction, the building was remodeled for its accommodation and about three months ago its installation took place. Trunking was saved by combining the toll and local lines in the new board while, at the same time, getting the full advantage of the multiple. That the board is giving unqualified satisfaction to both magneto and common battery subscribers is vouched for most heartily by Mr. Boardman.



Near Peak Load in the Exchange of the Story County Telephone Co., Nevada, Ia.

The common battery equipment has permitted, without question, the raising of rates, $3 per year for residence service and $6 for business service, while the magneto rate remains the same as before. This point of having the subscriber master of his own destiny is having its effect. Although the company has, as yet,

done no soliciting, the past two months has witnessed some 50 subscribers coming into the common battery fold, of their own volition. Of course, with the standard universal board, where changes can be made, a line at a time, no hardship nor particular expense is faced by the company. As soon as the company's outside construction is finished for the season, a general mild campaign of solicitation will be inaugurated. It is fair to presume, basing calculations on changes already made, that, through subscribers taking the initiative, the day is not far distant which will see this company's equipment exclusively common battery, with every subscriber paying the maximum rate.

Wire Chief's Desk and Power Board.

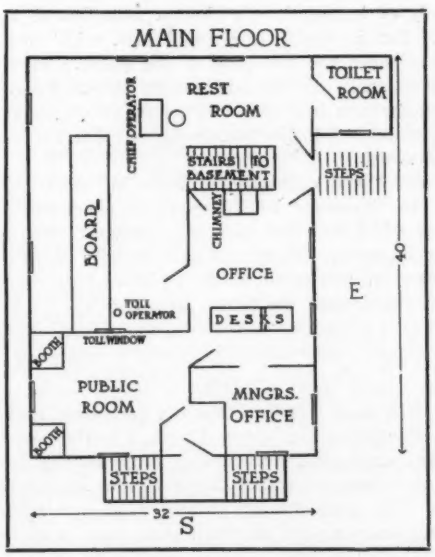
The untiring zeal of Manager F. M. Boardman alone, is a sermon in itself, and his example is well worthy of emulation. Coupled with this, however, was the ready co-operation of his official associates. As a result, these gentlemen can point to the Story County Independent Telephone Co. and say, with truth, that it is one of the most successful telephone companies in the state of Iowa.

The Terminal Room.

The accompanying illustration gives a very fair idea of the company's building as to the exterior. As it is centrally located, one-half block off of the main street, it becomes easily accessible from city business houses. Upon entering, one finds the interior a marvel of studied completeness for the purpose intended. On the left of the entrance is a commodious public room with a toll window, while booths occupy two of the corners. On the immediate right is the manager's private office, appropriately fitted with heavy oak furniture. This room in turn, opens directly into the main office which occupies the remainder of the right half of the building, with the exception of a small rest room and lavatory in the extreme rear. The rest of the left side is given over to the switchboard room. The basement is quite as complete in all details as the main floor, as can be seen by reference to the floor plans. It is constructed throughout of concrete, assuring positive protection from fire.

View of Offices.

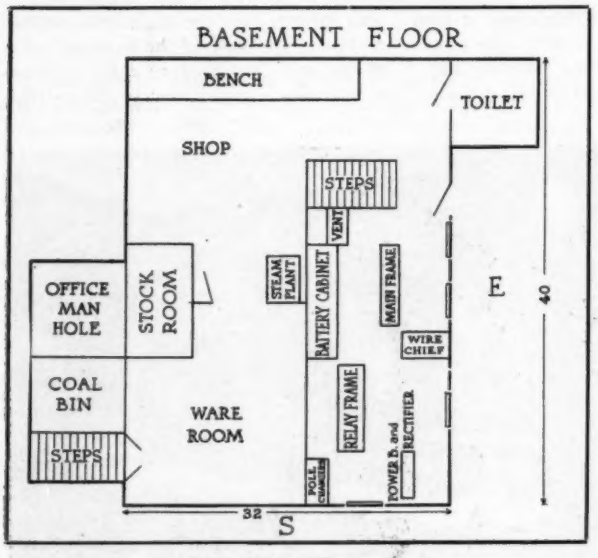
The new equipment of the Story County Independent Telephone Co. brings us to philosophize on the value of reliability.



Arrangement of First Floor.

The chief aim of every electrical manufacturer should be to put goods upon the market which represent the highest grade of skilled workmanship, the best material that money can buy, with the whole supported on a foundation representing the most advanced and original thought in honest and scientific construction.

Some are too prone to exploit their commodity entirely through the medium of printer's ink and salesmen, with little to expect from the inherent merit of the manufactured article. At best, it is a short-sighted method, since it tends decidedly to lock the door against subsequent sales and compels con-



Floor Plan of Basement.

stant search for new fields, with scant prospect of new business in old ones.

How much more satisfactory is it, then, to primarily delegate *merit* to act as the chief selling vehicle, with wide-awake intelligent salesmen as fitting runners-up, and a comprehensible dash of printer's ink, now and then, to round out the combination.

Of course, the manufacturer does not pretend to claim a monopoly of honest thought, honest manufacture and honest results. But in our own personal case, which naturally interests us most, the far-reaching and positive satisfaction of the latter—honest results—wherein the customer plays his part and benefits thereby, constantly spurs us on to greater endeavor, to be ever in the lead to the end that his benefits may never diminish.

This belief and demonstrated truth in "merit" has spelled success to thousands of Independent telephone companies, many of which had been primarily equipped with inferior or limiting apparatus. Then, one day the light dawned, changes were made in part or in whole, some working gradually and economically toward the latter point, but always to one end which meant greater satisfaction to the subscriber, lower cost of maintenance and subsequent greater economy.

Electrical Trades Directory and Handbook.

The Electrician, Salisbury Court, Fleet street, London, E. C., announces the forthcoming thirty-second annual edition of the electrical trades directory and handbook, known as "The Big Blue Book," corrected to January 31, 1914. This well-known and standard directory is a cheap and comprehensive book of reference and is known as the combined "Kelly" and "Whitaker" of the electrical industry.

Paragraphs.

PALMER-MOORE CO., of Syracuse, N. Y., manufacturers of the Palmer-Moore trucks, has issued a folder showing the company's four-post express motor truck with water-cooled motor. The water-cooled motor has been developed after careful experimenting and thorough testing, it is stated, to satisfy the demand of prospective truck owners desiring the water cooling system. The company believes it has developed a water-cooling motor as nearly ideal as it can be made. Other literature has been issued by the company showing the company's open express, stake body and panel top trucks for different types of service.

E. C. Hurd, to Be Consulting Engineer.

E. C. Hurd, chief engineer in charge of valuation for the Nebraska State Railway Commission, closed his regular duties in that capacity on December 1, but he will continue to act as consulting engineer for the commission. Mr. Hurd was appointed to the position of chief engineer on June 1, 1909, at which time the state legislature delegated the commission to make a state-wide appraisal of the properties of all railroad, express, telegraph and telephone companies. He has personally directed this work up to December 1.

The entire initial appraisal, including the valuation of the steam railroads, has now been completed, and because the future work will be of a less interesting type and more statistical, Mr. Hurd has asked to be relieved of the directing of it. He will enter private practice with offices at Lincoln, Neb., and Chicago, Ill. Mr. Hurd completed his technical engineering education 20 years ago, and has been engaged continuously since that time in engineering work, particularly in railroad work, public improvements, construction and economics. C. H. Gerber, who has been principal assistant in the valuation department will assume the duties of chief engineer.

Dry Cells That Have Given Long Service.

A very interesting communication has been received by the Nungesser Carbon & Battery Co., of Cleveland, Ohio, from the Union Telephone Co., of Owosso, Mich., regarding the long service given by two "1900" dry batteries furnished by this company. W. H. Cambert, manager at the Clare, Mich., exchange of the Union company, states that "while replacing new batteries, I found a pair of your batteries that was put

Their Outward Appearance Is Like New.

in November 6, 1906, and was taken out March 4, 1913. These batteries were in use six years, three months and 29 days."

Both Mr. Cambert and W. J. Melchers, general manager of all the companies comprising the Union system, with headquarters at Owosso, vouch for the service given by these batteries. The latter have been forwarded to TELEPHONY and one would not know from their outward appearance that they had stood such a long siege in service, as they look almost like new.